Battery Charging / Connecting cable

Charging

- Majority of battery issues can be traced to improper charging
- Improper charging settings will lead to overcharging or undercharging condition. Each condition will result in reduced capacity and/ or battery life
- To ensure proper charging the inverter / charge controller should be set to the recommended battery voltage settings. If battery is in an uncontrolled temperature environment, temperature compensation should be used.

Charging Safety

There are several important safety precautions that should be taken when charging a battery:

- Do not use open flames when checking the electrolyte levels in storage batteries
- Keep all open flames, sparks and matches away from the charging area. DO NOT SMOKE around the charging area
- Only properly trained personnel understanding all safety measures, charging parameters, and required maintenance prior to charging should charge batteries
- Follow charger manufacturer's recommendations for charger connection / disconnection sequence. All mechanical connections on the battery and charger should be tight. Torque all connections to specification. Loose connections can overheat and cause arcing that could cause a gassing cell to explode, or cables to become hot to the touch.

Vent plugs should be always kept firmly in place to minimize electrolyte spray when the battery gasses

Connecting/Disconnecting Charger

Always turn the charger OFF before connecting or disconnecting a battery. Live leads can cause arcing and sparking, which could cause an explosion if battery gases are present. In addition, the contact surfaces of the plugs or connectors will become pitted over time.

Temperature

Many chemical reactions are affected by temperature, and this is true of the reaction that occurs in a storage battery. The chemical reaction of a lead-acid battery is slowed down by a lowering of the electrolyte temperature that result in less capacity. A battery that will deliver 100% of rated capacity at 77° F will only deliver 65% of rated capacity at 32°F.

Excessive heat will increase the natural corrosion factors of a lead acid battery. This increase corrosion of the positive plates contributes greatly to reducing the overall life of the battery.

Depth of Discharge (DOD)

Depth of discharge is a function of design. The deeper the discharge per cycle the shorter the life of the battery.

A cycle is a discharge and its subsequent recharge regardless of depth of discharge.

System should be designed for shallow discharges. The result of shallower discharges is typically a larger capacity battery at prolonged battery life.

Charging Batteries

The following precautions shall be taken when charging or recharging vented lead acid batteries:

- Check that the battery ventilation holes are clean to allow the hydrogen gas to escape and prevent the battery from exploding. If the battery is not maintenance-free, remove the filler caps to vent hydrogen gas. Stand at arm's length when removing battery caps. Before recharging a battery, check the electrolyte level, if the electrolyte is covering the top of the plates, do not add more water. If the plates are not fully covered, fill to the designated level before charging and top up after charging if necessary. Never add electrolyte during charging
- Fill batteries with distilled or demonized water, not tap water
- Wear safety gloves, chemical apron, goggles, and face shield while removing caps and filling up batteries with water
- Make sure the power is shut off at the charger before connecting or removing the cable
- Clamps Connect the charger's positive (+) lead to the battery's positive terminal and the negative (-) lead to the negative terminal. Charge batteries in a properly ventilated area
- Do not smoke, carry out hot work (e.g., welding, brazing, grinding), or use a mobile phone in the charging area.

There are different types of defects occur in lead acid battery reason and solution are mention below:

1. Battery Overheating During Charge

Reason:

- Malfunctioning Charger Equipment
- Inverter voltage settings out of specification
- Defective or weak cell
- High resistance connection within battery
- Low electrolyte level.

Solution:

- Repair or replace charger equipment
- Adjust Voltage Setting according to user guide of manufacturing
- Replace problem battery/ Or Defect battery
- Check for hot wires, cells, intercell connections, charging cables. Repair or replace defective component
- Top up with DM water.

2. Battery not able to supply power as when initially installed:

Reason:

- Battery not completely charged
- Weak, leaking, or defective cell(s) in battery
- Ground or Short Circuit in the battery
- Battery will remain in under charge condition and due to discharge condition sulphation occur.

Solution:

- Always set the proper charging parameter according to given specification of manufacturer
- Replace the problem cell with the help of service team or manufacturer
- Remove the scope of short circuit
- Verify charge controller / Inverter charge settings are within recommendations. Recharge battery until battery is at full state of charge.

3. Battery charge do not change during ambient temperature variations:

Reason:

- Temperature compensation does not present or not working.

Solution:

- Verify temperature compensation is installed and working correctly.

4. Low electrolyte

Reason:

- Crack and broken container or terminal crack
- Cell missed during top up

- Access gassing during charging
- Defective or weak cell.

Solution:

- Replace crack and broken terminal
- Proper top up each cell
- Used mist eliminator during charging
- Replace or change the battery.

5. Unequal Cell Voltage

Reason:

- Terminal is not clean due to lack of input current
- Weak and defective cell
- Battery access used.

Solution:

- Clean and maintain the battery condition properly on time
- Replace the battery coordinate with manufacturer
- Change from new battery with same capacity and power.

Result

There are different points is mention above if all equipment and procedure followed by user than problem will be resolved immediately. So, user need to follow manufacturing specification and parameter properly.