RENTECH®
RENEWABLE TECHNOLOGIES

LITHIUM IRON PHOSPHATE SOLAR BATTERIES

QUICK START GUIDE

INTRODUCTION

Each Lithium Iron Phosphate (LFP) battery has a built-in Battery Management System (BMS) which controls the charge and discharge voltages, currents, temperature, state of charge (SOC), state of health (SOH) and safety of the battery.

It includes a RS485 communication port and DIP switches for parallel operation and communication with the Rentech Oryx inverter, as well as a RS232 port for factory and support testing. Communications protocols are custom and can not be used with other Inverters or RS485/RS232 communication devices unless approved by Rentech.

> ⚠️ **DO NOT CONNECT THE RS485 OR RS232 PORTS TO UNSUPPORTED INVERTERS OR COMMUNICATIONS DEVICES**

LFP batteries are shipped from factory in a partially charged state and with the batteries switched off. A high impedance voltage of ~ 8Vdc to 18Vdc on the terminals are normal and an indication that the battery's BMS is on, even though the battery is off.

CONNECTIONS AND START-UP

Please refer to the User manual for details.

1. Ensure that you have the correct battery voltage for the charger/inverter. **Do not use a 24V battery on a 48V system or vice versa.**

> ⚠️ **DO NOT CONNECT RENTECH 24V LFP BATTERIES IN SERIES TO FORM A 48V SYSTEM**

2. With the charger/inverter off, measure the input impedance on the battery terminals to ensure there is no short circuit.
3. Connect the battery positive and negative terminals to the battery terminals of the charger/inverter using the correct cable size and battery fuses/ breakers ratings. For a single battery, the address DIP switches must be set to: Off-Off-Off-Off – "0000".
4. For multiple batteries in parallel up to 15 maximum, follow the instructions in the User Manual.

a) Connect the RS485 cables from A to B, A to B, etc.
b) Don't "daisy chain" the battery cables: Connect each battery's cables to a common + and – busbar or terminal.
c) Address DIP switch settings:
  i) Master battery : 1000
  ii) Slave 1   : 0100
  iii) Slave 2   : 1100
  iv) Slave 3   : 0010
  v) Etc.
  vi) (Note it is binary in reverse (mirror image)).

5. Double check that the polarities are connected correctly and all nuts/screws properly tightened.
6. Make sure the battery cables are not connected to the inverter's PV terminals or the PV cables connected to the inverter's battery terminals.
7. With the battery fuse or breaker not connected and the loads on the inverter disconnected, start-up the battery by pressing down and holding the RESET button for approximately 3 seconds until the LEDs come on, then release the RESET button.
8. The SOC LEDs on the battery will indicate the %SOC and the green RUN LED will flicker at ~1Hz (1 second). If the red ALM (alarm) LED flickers at ~2Hz (0.5 seconds), it indicates a low SOC warning and NOT that the battery is faulty. Measure the battery voltage with a voltmeter to determine the actual voltage.
9. If the red LED is permanently on, the BMS has detected a health or safety event and disabled the battery – Contact your supplier or Rentech.
10. Close the battery fuse/breaker to connect the battery to the charger/inverter.
11. Switch-on the charger/inverter while checking the battery current with a clamp-meter to verify it is only the standby power rating of the charger/inverter.
12. Program the charger/inverter for the correct battery type (Lithium/User defined), charge voltage and current and end of discharge (EOD)/low voltage disconnect (LVD) settings for the specific battery from the table below.
13. **NB:** For inverters, **ENSURE** that the inverter low voltage disconnect value is set at least 1V (preferably 2V) higher than the battery EOD voltage to ensure the battery's BMS does not switch-off the battery under load conditions before the inverter does. This will enable you to start-up the battery when the AC power has returned or the PV power is sufficient to re-start the inverter before connecting loads again.
14. **NB:** Before connecting loads, first charge the battery to full capacity to prevent EOD/LVD disconnect under load conditions due to insufficiently charged battery.

BATTERIES SPECIFICATIONS SUMMARY

Model: BTESF	48V 50-R	48V 100-R	48V 150-R	24V 100-R	24V 200-R
Nominal voltage (V)	51.2	51.2	51.2	25.6	25.6
Rated capacity (Ah)	50	100	150	100	200
Total energy (Wh)	2560	5120	7680	2560	5120
Usable energy to 80%DOD (Wh)	2048	4096	6144	2048	4096
Charge voltage[1] (V)	55.2	55.2	55.2	27.6	27.6
Battery EOD/LVD voltage (V)	44	44	44	22	22
Preferred charger/inverter LVD volts	46	46	46	23	23
Maximum charge current[2] (A)	10	20	30	20	20
Peak discharge power 3 seconds (W)	3360	6720	10080	3360	6720
Operating temperature (°C)	0-50	0-50	0-50	0-50	0-50

Notes:

1. This applies to float and bulk charging. Equalization charging should be disabled or also set to same charge voltage.
2. For batteries in parallel, ensure the maximum charger/inverter charge current is limited to the correct value (or less) of the number of batteries in parallel. Also ensure that the combined maximum charge current for multiple chargers/inverters in parallel is correctly limited.

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