JT63 series Electronic Load & Charger Test

Electronic Load's Battery Simulation

In CV mode, the electronic load can simulate a battery, but can only simulate the idealized battery, and can not simulate the battery's internal resistance. Therefore, if testing chargers in CV mode, once chargers is charging in constant voltage, the charge current will be out of control. Therefore, before making the charger's test, it is required to set the maximum current protection of the electronic load so as to prevent chargers from being damaged.

Due to the reason mentioned above, sometimes, it is needed to use the CR mode of the electronic load to simulate a battery. But many electronic loads in the market are not fit to apply to CC source chargers. These kinds of electronic loads will cause severe oscillation. The measured results seem to be stable, but in fact, it is because multi data are averaged, and it is not reliable. So if you want to use the CR mode of the electronic load to simulate the battery, please make sure that the electronic load you selected can be apply to CC source and CR source when in CR mode.

JT63 series electronic load can automatically detect the type of the measured power supply. And with the special circuit topology technology, JT63 series electronic load can achieve seamless transition, so it can match with the electronic load which can do constant resistance by hardware, and achieve the ideal battery simulation.

Generally speaking, simulating the battery no matter in CV mode or in CR mode, both have their advantages and disadvantages. Their test effects are all depends on the output capacitance of the charger, because the actual battery itself is a big capacitance. Many chargers' capacitance is comparatively small. Lack of output capacitance of the charger might cause the oscillation. The oscillation and oscillation amplitude are closely related to the output capacitance value and the loop circuit speed of the electronic load. In general, the faster the full range current rising time of the electronic load is, the smaller the dependence on the output capacitance of the charger is, the less the possibility of causing oscillation is. So when using the electronic load to simulate a battery, it is better to choose the electronic load with faster full current range rising time. The full current range rising time of JT63 series electronic load is 10uS.

Constant Current Charge State Detection

When the electronic load is in CV state and the set voltage is lower than the transition point of the constant voltage equalizing charge, the charger will be forced to charge in constant current. At this time, the electronic load can real-time display charge current (I) and current ripple (Ipp).

Some intelligent chargers, in constant current charge state, can produce a curve which is very close to the ideal charge curve of the battery. At this time, you can adjust the set voltage of the electronic load and record the response current and draw a complete charge curve. For the simple application, generally there are two phases: charge in low voltage and trickle current and charge in high voltage and constant current. The charge current in these two phases are different.

Constant Voltage Charge State Detection

When the electronic load is in CC state and the set current is higher than the current of charging the charger in constant current, the charger will be forced to charge in constant voltage. At this time, the electronic load can real-time display the charge voltage (V) and voltage ripple (Vpp) of the constant voltage equalizing charge mode.

In this state, when further reducing the set current to a certain value, the charger will be in floating state. The current at the moment of voltage falling is is the comparison current of being in floating state. At this time, the electronic load can real-time display the floating constant voltage (V) and voltage ripple (Vpp).

Complete Simulation of the Whole Charge Process

JT 63 series electronic load, in CR mode, can automatically match the CC or CV state of the charger. The whole charge process is the process of changing the equivalent impedance of the actual battery from small to big. Thus, setting the electronic load in CR mode and then rotating the rotary knob to turn up the input set resistance can simulate the whole process of charging battery. Meanwhile, users can observe the voltage and current change, ripple voltage and ripple current of the electronic load.

Working Point Test of Ni-MH / Ni-Cd battery Trickle Current Charge

In CV mode, the electronic load can simulate the voltage falling process of the Ni-MH/ NI-Cd battery being fully charged. Users can observe the process of the charger charging from in fast speed constant current to in trickle current and judge the trickle current (I) and current ripple (Ipp) by setting the set value to a high value first and then using the rotary knob to adjust the value to a low value.