

Application Note

Discharge Test on a Battery While it is Still Online

Battery-capacity testing is an essential part of battery maintenance and the most reliable health indicator of a battery. Although it might be considered as time-consuming, only the capacity test provides in-deep information on a battery condition which cannot be obtained by other rapid-testing procedures (like internal resistance test).

To perform a capacity test (also known as a discharge or load test) no complex procedures are required. Under a controlled condition, a measurement of energy discharged from the battery on to an external load is all that is required. The “controlled conditions” refer to keeping the discharge current, power or resistance constant (throughout the process or in certain intervals), while the battery voltage is being monitored.

The accurate measurement of the capacity requires all chargers to be disconnected (to avoid battery refill during the test). Regarding the battery loads, in most cases the capacity test is performed on a battery in the offline mode (the battery is disconnected from its regular load). However, the special battery applications such as UPS in hospitals or computing facilities cannot be tested in the offline mode since interruption in the supply cannot be tolerated. Therefore, the capacity test must be carried out “live” (the battery is online).

Supported by the Battery Load Units – BLU families of devices, the capacity test can be performed on both – online and offline batteries. Connection diagram of the BLU device to the configuration “battery + regular load” is presented in the Figure 1.

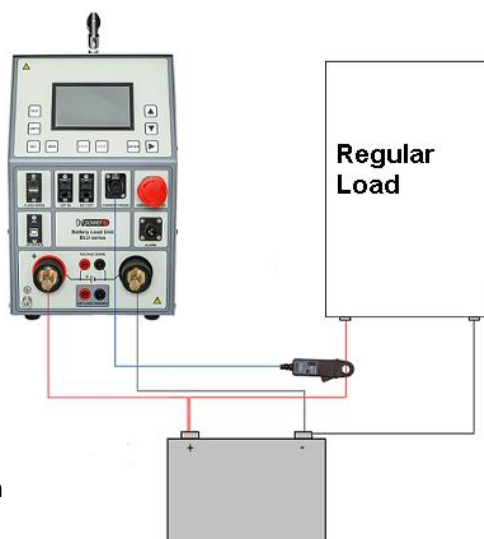


Figure 1 – BLU to battery connection diagram (while battery is online)

The energy drained by the regular load needs to be taken into account and measured – otherwise, the obtained capacity result will be inaccurate. The simplest way to measure the external current is to use a current probe (as presented in the Figure 1). In this connection, the BLU device will regulate its own discharge current so that the total (user selected) discharge current will be equal to BLU current + current probe (load) current.

However, in a case of high load capacity demands, using additional load units may be required in parallel with a BLU. However, when connecting additional load units to the battery, it may not be practically feasible to connect the current probe to measure all load currents (except the BLU current which is measured internally). In this case, the BLU offers an alternative solution: the current probe can be connected in such a way to measure the total battery current (Figure 2). In this connection, BLU will regulate its own discharge current so that the total (user selected) discharge current is equal to the current measured by the current probe.

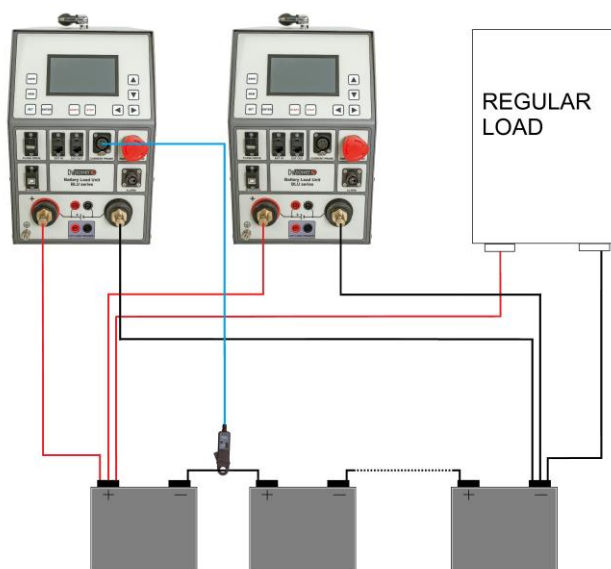


Figure 2 – 2 x BLU to battery connection diagram (while battery is online)

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