

Battery Evaluation Procedure for AlphaCell™ SMU-F/SMU-FTY Batteries

To help identify batteries approaching end of life in an operating power system, test #1 should be performed at each maintenance interval. For batteries not installed in an operating power system, test #2 or #3 may be performed. For accuracy, tests must be performed on fully charged batteries.

A battery failing any of the following combined tests is defined as a faulty battery. The battery will be replaced under the terms of the warranty if within the defined warranty period.

1. Conductance/Impedance Test – Measure the conductance of each battery. Any battery that possesses a conductance that is 50% less than the initial reading taken at the point of install can be considered suspect of being below 80% capacity and should be evaluated further. The battery temperature must be approximately the same each time this reading is taken. Consult table below for guidance.

And

Float Voltage Test – Measure the float voltage of each battery in the string that is on float charge. Any battery in the string measured at 13.2 volts or less is a suspect battery and should be further evaluated with the steps below. Any battery below 12.8 volts should be replaced. The 13.2 & 12.8 voltage values are based on a 77°F (25°C) temperature. Adjust the voltage for higher or lower temperatures by 0.0168 Volts per battery per degree Fahrenheit. The higher the temperature above 77°F (25°C) the lower the voltage will have to be adjusted and vice-versa for temperature below 77°F (25°C). (i.e.: a temp of 89°F (32°C) would have a corresponding voltage of 13.0 volts).

2. Conductance/Impedance Test – Measure the conductance of each battery. Any battery that possesses a conductance that is 50% less than the initial reading taken at the point of install can be considered suspect of being below 80% capacity and should be evaluated further. The battery temperature must be approximately the same each time this reading is taken. Consult table below for guidance.

And

24 Hour Open Circuit Test – Measure the open circuit voltage of the suspected battery 24 hours after the battery has come off of float charge. Care must be taken to ensure that the battery is at full state of charge when it is disconnected from the power supply. The battery should exhibit a voltage about 12.60 volts. A battery below this voltage should be replaced. A fully charged battery below 12.6 volts is below 80% capacity, but a battery above 12.6 volts is not necessarily above 80% in capacity. Batteries that have been sitting for extended periods should be recharged after 6 months or when they reach 12.48 volts (75% capacity), which ever comes first depending on the storage temperature.

3. 24 Hour Open Circuit Test – Measure the open circuit voltage of the suspected battery 24 hours after the battery has come off of float charge. Care must be taken to ensure that the battery is at full state of charge when it is disconnected from the power supply. The battery should exhibit a voltage about 12.60 volts. A battery below this voltage should be replaced. A fully charged battery below 12.6 volts is below 80% capacity, but a battery above 12.6 volts is not necessarily above 80% in capacity. Batteries that have been sitting for extended periods should be recharged after 6 months or when they reach 12.48 volts (75% capacity), which ever comes first depending on the storage temperature.

And

100A Load Test – Measure the voltage of each battery at the end of a 10 second 100-amp load test. Again, the temperature must be equivalent to that of the original test performed at the point of installation. A significant drop in voltage versus the previous test will indicate deterioration of the battery. A 12-volt battery that falls below 10.80 volts should be considered faulty and should be replaced.

| Midtronics Conductance Models 3200 / microCELLTRON | 12-50-FR | 12-75-FR | 12-105-FR | 12-125-FR | 12-155-FR |
|--|--------------|-------------|--------------|--------------|---------------|
| Approximate Conductance Values New Battery @ 77°F (25°C) | 680-1020mhos | 400-600mhos | 800-1200mhos | 680-1020mhos | 1440-2160mhos |
| Suspect Battery @ 77°F (25°C) | <280mhos | <160mhos | <350mhos | <280mhos | <580mhos |

* To maintain consistent test results ensure the same Midtronics conductance tester is used for each test cycle.

For more information visit www.alpha.com

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