# Aimac Electronic Battery Analyser


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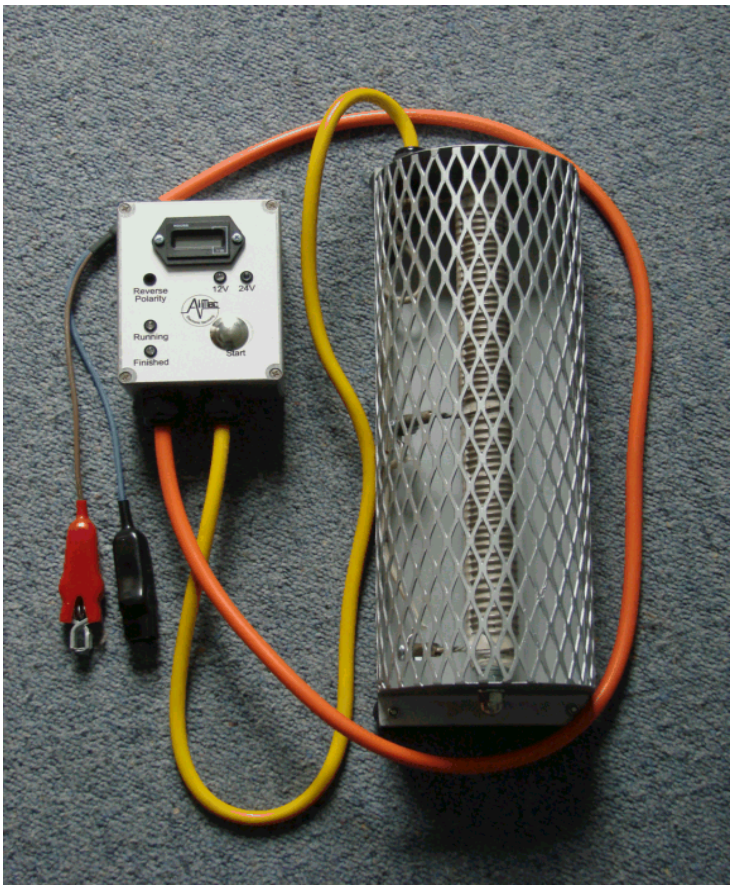



Revision One Unit with 12/24 Load Unit

# Introduction

## *Aimac Electronic Servicing*

Aimac Electronic Servicing is a small team of dedicated electronic serviceman who have been in business for 15 years. Recently it has moved into the disability and mobility area becoming the NZ service agents for PG Drives Technologies wheelchair and Scooter controllers. Aimac also has strong links to Dynamic Controls, and also services Phishang and Curtis controllers.

## *The Battery Analyser*

The Aimac Electronic Battery Analyser has been designed in response to a perceived need within the Mobility industry. Battery issues are a continual source of problems with mobility equipment, common battery testers do not adequately test deep cycle batteries and can actually damage the batteries.

Numerous ways have been developed to try and capacity test the deep cycle batteries used to drive wheelchairs and scooters. Everything from using a normal battery tester, to trying to read volt meters while driving uphill.

This results in a conservative approach to servicing and uneconomical policy on battery replacement, as both batteries are discarded as soon as a problem is detected, as there no easy way to tell which is the faulty battery. This generates a large number of waste batteries. Given the nature of New Zealand and the distance many of our support staff and clients cover, this can be a major problem.

The Aimac Electronic battery analyser has been designed to take the guess work out of battery diagnosis in the simplest way possible, considerable effort has gone into making this product safe, effective, portable, simple, and handsfree.

## *How it Works*

The Battery analyser works by using the batteries to pass a current across a specially designed Load Unit. The Load Units initially supplied with the Analyser have been designed for 12/24 30+ Amp/Hr batteries such as used in wheel chairs and Scooters, a Smaller Load unit is also available for batteries used in hoists and rams.

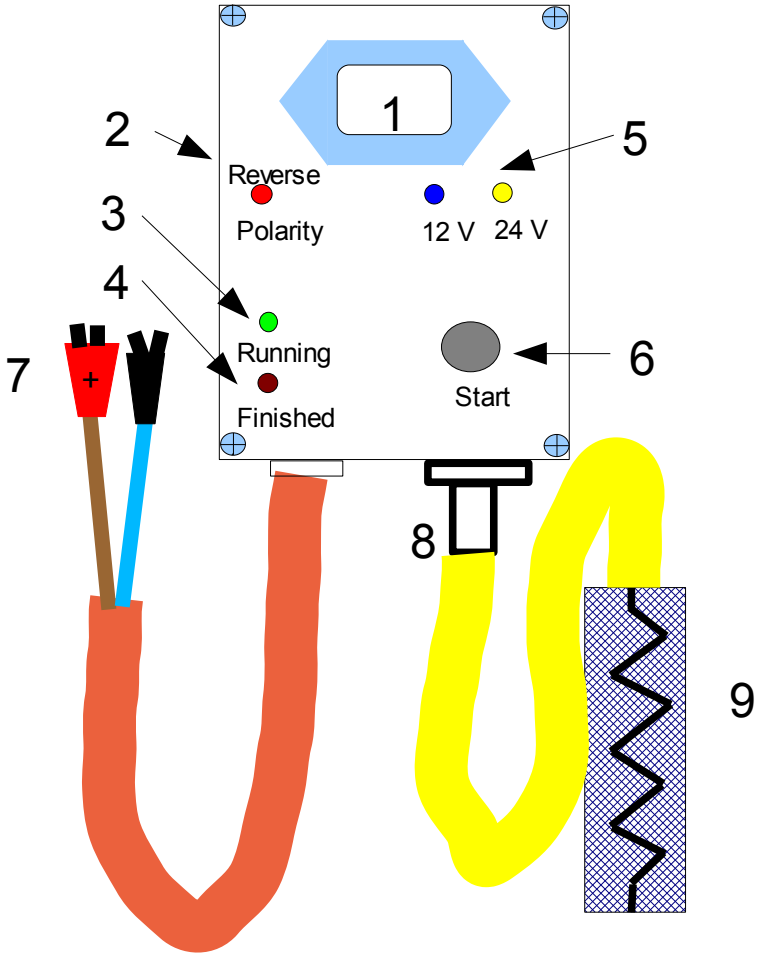
The Battery Analyser records the time taken for a **Fully Charged** battery to discharge to a set point. This point has been set to avoid any damage to good batteries[1]. The time taken is then stored until a new test is performed. The current drain has been designed to be similar to that generated by a scooter travelling at full speed. This test typically takes 1-3 hours depending on battery type, and condition, but requires no operator supervision.

This allows you to have a comprehensive measure of how a battery will perform in a real world application. Individual batteries can then be given a rating that directly relates to their performace in a live environment. Individual batteries of a similar type and rating can now be grouped as a working set, and poor performing or damaged batteries can be easily identified and destroyed.

This should help reduce both time and effort taken to identify performance problems with deep cycle batteries, and reduce the amount of batteries replaced.

1 Poor or Damaged batteries will deterioriate with continued testing.

# Description




Picture Revision 2 AEB Analyser

## Functions

1 Time Display in Hr :1/10 Hours
2 Reverse polarity Indicator LED will blink if batteries are connected incorrectly.
3 Running Indicator LED will show green if test underway.
4 Finished Indicator LED will show red once test is complete.
5 Voltage Indicator LED will show what voltage is being tested.
6 Button used to start test.
7 Battery Connectors
8 Plug for plugging in different Load Units
9 Load Unit

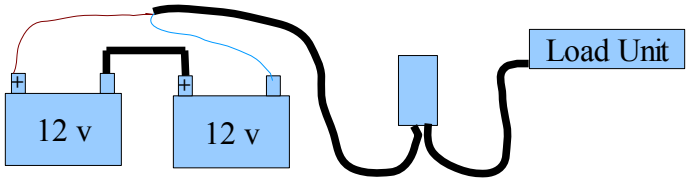
# What to do

It is now easy to test a battery, just use the following steps;

## *Instructions*

1) Make sure batteries are **Fully Charged**, if testing two batteries then they must be **Equalised**[2] before testing.

2) Connect the Battery Analyser to the batteries as shown.




Note :- *If batteries connected incorrectly the Reverse Polarity indicator will blink.*

2) Read and record previous test result if required.

3) Check correct voltage lights are showing.

4) Press Start.

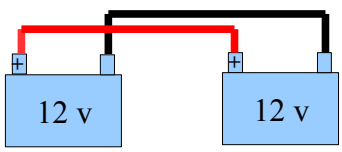
5) Check the **Green** **Start** LED is showing.

6) Check periodically until the **Red** **Finished** LED is lit. Typically 1-3 hours.

7) Read off result.

8) Disconnect Batteries.

2 When testing multiple batteries it is important to **Equalise** the batteries before testing. To do this you connect both the batteries together by connecting the positive to positive, and the negative to negative and then leave them to settle for 10 minutes. After 10 minutes check that the batteries are supplying the same voltage. If they do not have the same voltage then check the batteries individually.



# Results

As an initial guide this table gives an approximate value for various Batteries, results are highly variably between manufacturers and battery type so your figures may vary[3].

The table of figures below is an approximation and should only be used as a guide. Do not hesitate to gather your own data.

Aimac will gratefully receive any detailed test data to help track battery differences.

## Table of Results

| Battery Type | Amp Hour Rating | 30 | 40 | 50 | 60 | 70 |
|---|---|---|---|---|---|---|
| Wet lead Acid | Excellent | > 2 | > 2.2 | > 2.4 | > 2.7 | > 3 |
| | Pass | > 1.5 | > 1.8 | > 2 | > 2.3 | > 2.5 |
| | Fail | < 1 | < 1.2 | < 1.5 | < 1.5 | < 1.5 |
| Sealed Lead Acid | Excellent | > 2 | > 2.3 | > 2.5 | > 2.8 | > 3 |
| | Pass | > 1.5 | > 1.8 | > 2 | > 2.3 | > 2.5 |
| | Fail | < 1 | < 1.2 | < 1.5 | < 1.5 | < 1.5 |
| Gel Cel | Excellent | > 2 | < 2.3 | > 2.5 | > 2.8 | > 3 |
| | Pass | > 1.5 | < 1.8 | > 2 | > 2.3 | > 2.5 |
| | Fail | < 1 | < 1.2 | < 1.5 | < 1.5 | < 1.5 |

## Your Results

It is important that you keep a record of your results, Aimac will try and gather differing statistics to allow for further detailed battery inspection. We would appreciate any further results being forwarded to us at **results.aimac@gmail.com**. When forwarding details we require the following information.

Battery Make

Battery Type

Battery Rating (Amp/Hr)

Analyser Result

Approx Age of Battery

Your opinion of the state of the battery (Good, Bad, Failed, not good enough)

Any other information that you feel important

3 Be aware that modern style batteries may require several charging cycles before they reach their full capacity.

# Warnings

Aimac have endeavoured to make this as simple and safe to use as possible and we will accept no liability for misuse of the product. In saying that we are dealing with powerful batteries and caution is advised. Please be aware of the following.

## *Electrical Warnings*

### Do Not use the Analyser while charging batteries

The batteries **must not** be connected to a charger while the Analyser is connected. Not only will this affect the results but it may damage both the Analyser, and the Battery charger.

### Make sure that batteries are correctly connected

When using the Analyser make sure that the batteries are correctly connected in series.

### Use the correct Load unit for your Batteries

The Analyser is supplied with an initial **Load Unit** suitable for High Capacity Deep Cycle batteries greater than **30Amp/Hr** capacity, Do not use this **Load Unit** for smaller batteries as damage may occur to those batteries.

A smaller **Load Unit** may be purchased for smaller capacity batteries.

Specialist **Load Units** can be designed if required

### When testing Do not use Flat or damaged Batteries

The Analyser is designed to cut off at a voltage whereby good batteries will be protected, however flat or damaged batteries can deteriorate with testing.

## *Heat Warnings*

All effort has been taken to reduce the heat generated by testing batteries, the Load Unit has been designed to dissipate a significant amount of heat safely, however the following warnings apply.

### The Load Unit is HOT

The Load Unit is designed to be handled during a test but will get HOT! Please handle with Care.

### Do not mount the Load Unit Vertically

The load unit casing is designed to dissipate heat, to avoid heat buildup if mounting the Load Unit on the wall make sure that it is mounted Horizontally.

### Do Not cover the Load Unit

Please do not cover the Load Unit as this will allow heat to build up.