

# PENTAMETER

The **Penta-meter** is the basic (and only) device that you need for the monitoring of batteries and power systems with auxiliary batteries operating under normal conditions.

**It appears simultaneously** in a clear and easily-readable 2 line, 16 digit LCD:

- a. Battery voltage range (12 to 72 volts)
- b. Highest volts recorded prior to restore (reset)
- c. Lowest volts recorded prior to restore (reset)
- d. Highest volts recorded over the last 24 hours.
- e. Lowest volts recorded over the last 24 hours.
- f. Ampere time both for loading when charged or discharged
- g. Ampere hours that over a period of time that the battery has been discharged or been uploaded (reset)
- h. Ampere hours that the battery has been discharged, or charged, over the past 24 hours.
- i. Ampere hour charged by Alternators, DC chargers wind or sun
- J. Ampere hours discharged by the inverter, DC lights, DC motors and appliances.

**Use the PENTA-METER for:** see also *Batteries Insight.com*

**A. Batteries:** For the optimal maintenance and efficiency of batteries: conduct the following **discharge test.:** Load the batteries 100% vol. Reset Penta-meter to zero. Discharge battery to the recommended lowest voltage level. The ampere hour reading (upper right meter) is the **retention (capacity)** of the batteries.

Download the batteries' capacity. Full means full, according to the SG reading. The difference between the ampere hour ampere hours charged and discharged as well as the **efficiency** of the batteries. (85% good and 70% is acceptable)

**C. Solar panels:** Keeps a record of power delivered over time and over the last 24 hours.

**D. Lights:.** Effectiveness: Compare different types and sizes.

**E. Freezer and refrigerators:** Effectiveness of different make and models: One can now determine exactly how much power be loaded into a specific type of battery and compare it with other models

### **F. Independent Energy Systems**

Keeps a record of all input power to the batteries and discharged artes of the batteries . A Pentameter tell the whole story: Did you have enough input power or need additional sources? Do you use more power than you expend? What is the condition of your batteries?

### **G. 4x4 and Caravan Campers**

Keeps a record of discharge and charge rates. Iit will also help to decide whether there is enough power in the batteries to support the operated appliances.

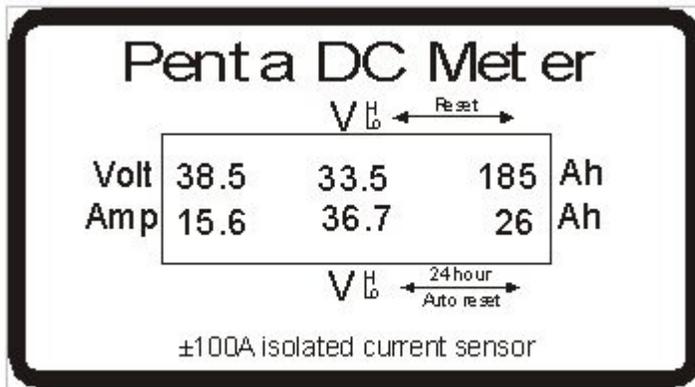
### **I. Keeping of Records**

It is essential to note every day, at the same time, your daily log, preferably before sunrise:

- a) Highest volts over last 24 hours: top base of Pentameter
- b) Lowest volts over last 24 hours: middle base of Pentameter
- c) Ampere hours over last 24 hours: at the right base of Pentameter

With these dtails you are able to analyse and plan the optimal performance for the system . Especially with regards to the state of your battery .

The **Multi Pentameter** retains exact records for your system. This record is maintained for more than 10 years onto an SD card - that can be downloaded onto my computer and transferred for analysis and subsequent reports.



### Front view:

### UPPER LINE:

**Volt:** This is the current of the battery volts

**V hi / lo:** The highest and lowest volts reached since reset is an alternative view. Batteries in a solar and wind system at least once a week full of properly loaded. **If your batteries at the lowest allowable volts comes, make sure you do not use it before it is properly filled not be loaded.**

**Ah: This is the total ampere hours in the batteries charged / discharged since reset.** This is the current total. Ampere hour that are loaded are added and withdrawn, to be deducted. This completely disappear if you reset and start again in advance tel. Minus one for the total show that more than stripped ingelaai is. Make sure you regularly reset the meter. (I would prefer every week). **One must always inlaai more than you can withdraw, because even a new battery is not 100% effective is not. Write this number down before you reset.**

### Bottom line:

**Amp** is now the ampere load or discharge a Minus (-) before the total indicates that more power be withdrawn as loaded.

**Hi lo V:** Highest and lowest volts achieved over the **last 24 hours**. These numbers change if the meter is not reset .. It is adjusted every hour for the last 24 hours of precise figure to appear.

**Ah,** This is the total of the ampere hours in the **last 24 hours** and the battery is charged and discharged. It is **automatically updated every hour** and will not disappear if you do not reset the meter.

**Keep a record of these numbers 24 hours. Write it down each day at the same time, preferably before sunrise. It will give you an exact picture in your system ahead. Without these numbers, I can not analyze your system, or advise you not.**

**Installation:** Pentameter

**The power (amps) you would have to meet by the "Isolated Current Censor" loop.** If the ampere verkeerdheid displayed, rotate the sensor to.

**Batteries To monitor:**

1. Stop all laaiers, inverters and other load on the batteries: There may **not** be **kragvloei** and after the batteries are not.
2. Make all the loose cables and wires to the **negative** pole of the battery tied.
3. Make the copper wire on one side of the sensor attached to the **negative** pole of the batteries.
4. Make all the cables and wires to the battery was (in no 2 above) on the other side of the sensor fixed. **The power now goes by the sensor.**
5. Make the **two wires** attached to the battery: red to **positive** and black to the **negegatief** of the batteries. The Pentameter now reads volts from the batteries and the amperes that after the batteries go.

**RESET TO,** MAKE ANY OF THE DUN wires (red or black) LOS AND MAKE IT MORE VAS. If you prefer you can un small switch in line inbou on any of these discussions.

**Solar panels:** Connect the **negative (-)** wire from the solar panels on the sensor. The meter is now showing the corkscrew of the solar panels, and the **volts** of the batteries

**Windlaaier:** Connect the **negative (-)** wire from the rectifier (rectifier) of the windlaaier to the sensor. The meter is now showing the corkscrew of windlaaier and volts of batteries.

**Inverter, lights, DC appliances, etc..** To see how much power each of the batteries go.: Install the sensor in the **negative** line **between the batteries** and the inverter, devices, etc.. Make sure you use enough cable **thickness:** This is a **100 Amp meter,** but can handle 150 ampere constant. (Make sure it is not hot.)