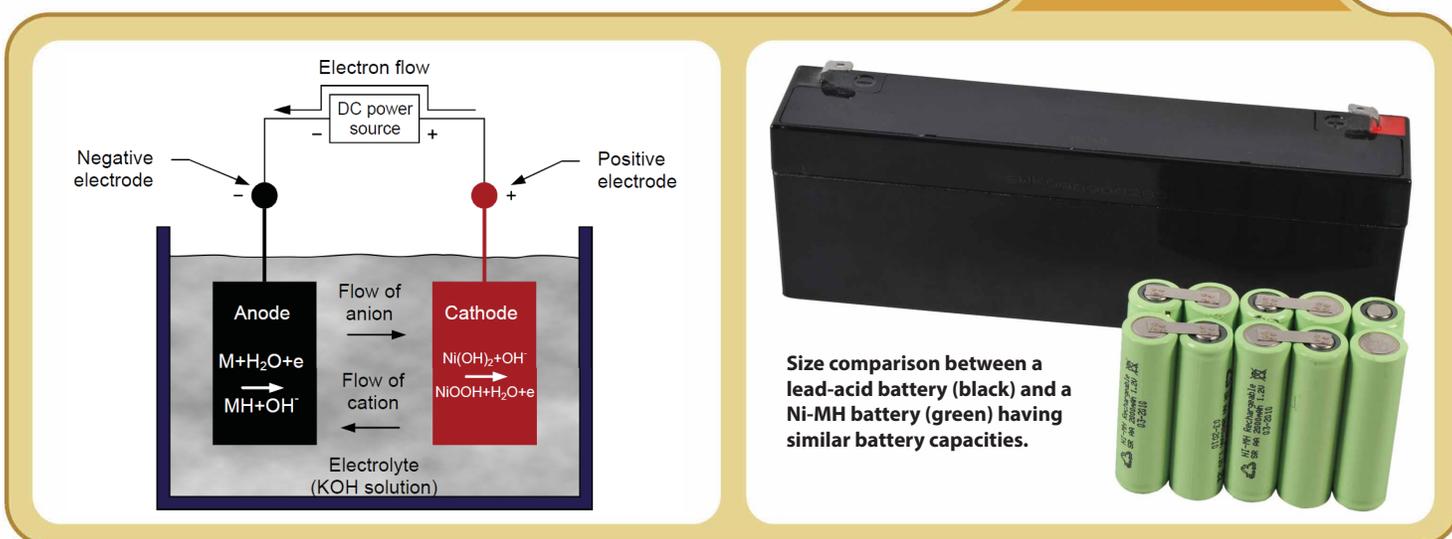


# Ni-MH Batteries

Course 86354

The Ni-MH Batteries course explains how a nickel-metal hydride (Ni-MH) battery produces electricity from a chemical reaction. The course familiarizes students with the charge and discharge characteristics of Ni-MH batteries. Students also learn the various methods of charging Ni-MH batteries, with emphasis on the various methods of terminating the charge (temperature cutoff, voltage drop, and rate of temperature increase).



The diagram on the left illustrates the charging process of a Ni-MH battery. It shows a cross-section of the battery with a negative electrode (Anode) on the left and a positive electrode (Cathode) on the right. A DC power source is connected to the electrodes, with the negative terminal connected to the anode and the positive terminal to the cathode. The electrolyte is a KOH solution. The anode reaction is  $M + H_2O + e^- \rightarrow MH + OH^-$ . The cathode reaction is  $Ni(OH)_2 + OH^- \rightarrow NiOOH + H_2O + e^-$ . Arrows indicate the flow of anions from the cathode to the anode and the flow of cations from the anode to the cathode. The diagram on the right shows a large black lead-acid battery and five smaller green Ni-MH batteries, illustrating that the Ni-MH batteries have similar capacities to the lead-acid battery despite their smaller size.

## Topic Coverage:

- » Understand the reactions occurring in a Ni-MH battery during charge and discharge cycles.
- » Measure different characteristics of a Ni-MH battery during discharge.
- » Calculate the energy released during a discharge cycle.
- » Become familiar with the effects of charge input, charge rate, and ambient temperature on the voltage and temperature profiles of a Ni-MH battery during a charge cycle.
- » Know the different charging methods and charge-control techniques commonly used when charging Ni-MH batteries.

- » Evaluate which charging method is best suited to a given situation.

## Features and Benefits:

- » Five types of Ni-MH battery chargers included!
- » Computer-controlled educational Ni-MH battery chargers.
- » User can set various battery charging parameters.

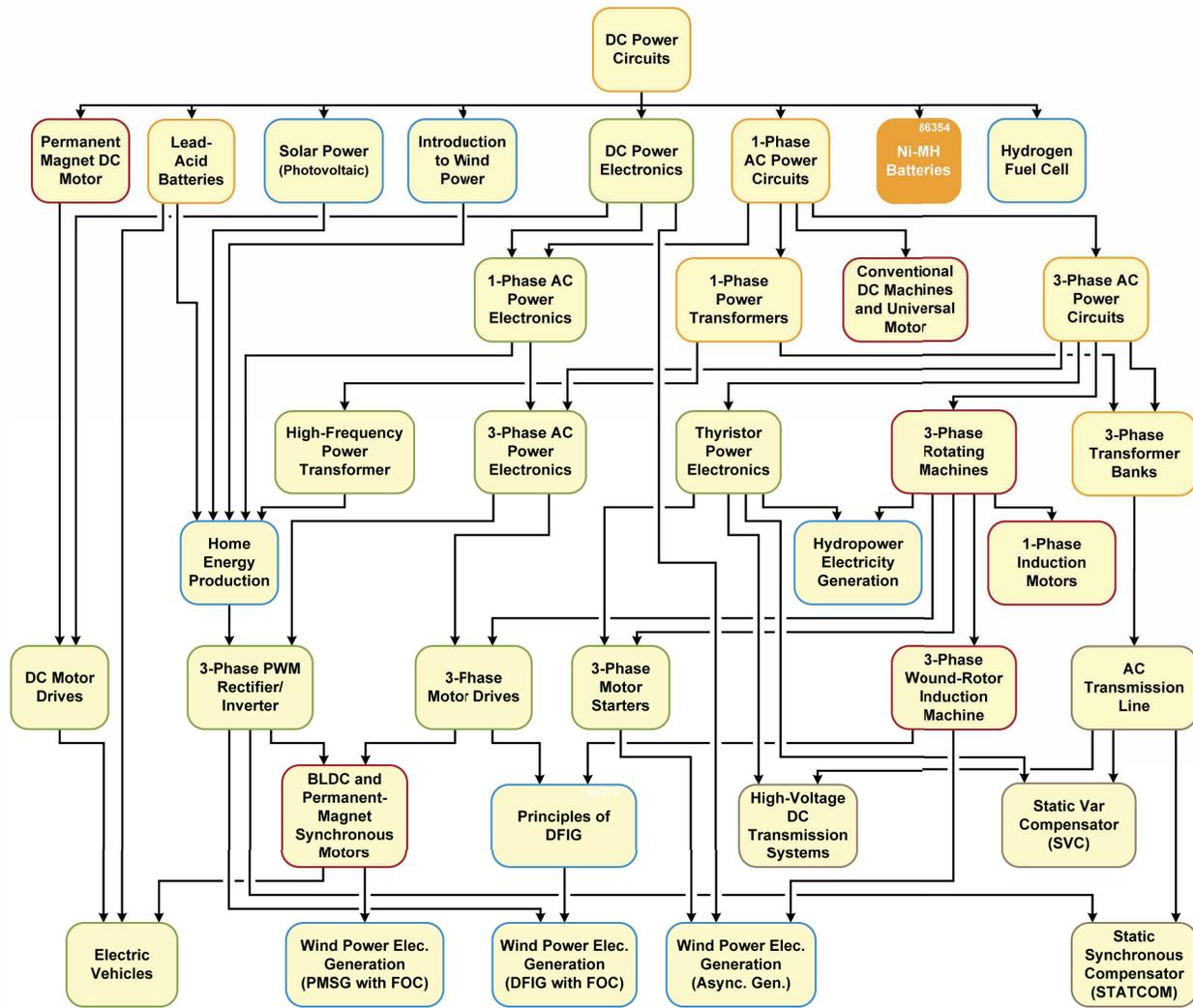
**4Q** DYNAMOMETER  
POWER SUPPLY



**Lab-Volt**<sup>®</sup>



# Lab-Volt Electric Power Technology Training Program



## Equipment

Qty	Model	Description	Qty	Model	Description
1	8131	Three-Module Workstation	1	8968-5	8960 Firmware Function: Ni-MH Battery Charger
1	8801-A	Ni-MH Batteries	1	86354/-1	Student Manual/Instructor Guide
1	8951-L	Connection Leads			
1	8960-C	Four-Quadrant Dynamometer/Power Supply			

Lab-Volt reserves the right to make product improvements at any time and without notice. **Note:** A computer is required to perform the exercises.



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