

Ample Power Company



Next Step System

Drawing AT9610287

The Next Step System is our most economical solution to the power equation. Refer to drawing AT9610287. The Next Step system offers a fast full charge with an alternator of your choice, regulation for solar and wind chargers, and complete monitoring of a house bank and a starter bank.

Parallel Solenoid

The Next Step Regulator, shown in the top left of the drawing, controls the alternator and the parallel solenoid which connects the house and starter banks together during the charge process. The Next Step drives the parallel solenoid when it finds that the house bank voltage has risen above 12.9/25.8 Volts. This voltage indicates that the house bank is charging. The solenoid is opened should the house bank voltage fall below 12.8/25.6 Volts.

NOTE: The SAR-V3 regulator operates the solenoid even when the engine isn't running, so by using it instead of the Next Step Regulator, charge distribution for the AC charger will also be accomplished.

Temperature Sensing

The Next Step Regulator senses the temperature of the house bank and corrects the charge voltage accordingly. Note also that the Next Step Regulator is connected to the Energy Monitor II, H1 which holds the Next in the absorption mode until the house bank is full. The full criterion is programmed on the EMON II. To be full, the battery voltage must reach the programmed voltage value and the current through the battery must decline below the programmed current value.

Fuse Protection

The house bank is protected by a 400 Amp fuse. A common problem is a battery short caused by the output wire from the alternator loosening from the alternator and shorting the battery. The 400A fuse protects such a drastic fault, and will prevent an electrical system fire. Operating a large house bank without a fuse is an open invitation to fire at sea with all of its consequences including loss of life.

Amps Shunt

The Energy Monitor II, H1 completely monitors the house bank, reporting Amp-hours remaining as well as the more familiar Volts and Amps. Current through the battery is mea-

sured via the 400 Amp shunt in series with the negative side of the battery.

Remote Alarms

Shown connected to the EMON II is a remote alarm. While the EMON II includes an internal alarm, it may not have the volume to attract the attention of a helmsman. Alarms from the EMON II are individually enabled or disabled, and the setpoints are programmable.

Not shown are alarms which can be connected to the Next Step Regulator. This regulator has no an internal alarm, but can drive external alarms to report abnormal conditions.

The importance of alarms can't be overstated. No one has the time to monitor all meters on a timely basis to prevent any abnormal condition from persisting. Alarms can prevent 'sudden failures'. That is, an alarm can alert you to a fault before the whole electrical system collapses . . . before an undetected condition kills the batteries from over or undercharge.

Laptop PC

Also shown connected to the Energy Monitor II is a laptop computer. With the optional PC software, electrical system data can be displayed on the computer screen and/or logged to disk. What is displayed and what is logged are independent. That is, you can look at one set of information, while logging another set. The laptop computer can serve as a second display 'head' for the electrical system. By logging data over time, a profile of energy usage and replenishment can be developed.

Simple Battery Switching

Note the two switches, S1 and S2 on the diagram. S1 allows the house and starter battery to be connected which will allow engine starting from the house bank if necessary. S2 is used to disconnect the starter battery from the starter motor in the event that the starter solenoid sticks shut and continues to drive the motor. S2 can also be used as a security switch, preventing unauthorized engine starting.

Alternator Current

Also shown on AT9610287 is an ammeter and shunt that shows the alternator current. Typical alternator ammeters use a bi-metal strip that deflects the meter according to the temperature of the bi-metal piece. These are economical, but

rarely rated above 60 Amps. They also require that heavy wire run to the ammeter and back to the battery. By using a shunt, large wire is only required to and from the shunt which can be located close to the alternator and batteries. Two small wires connect the shunt to the meter.

Eliminator

As mentioned, the Next Step System offers high performance, yet is economical. The starter battery is forced to accept the charge regimen of the house bank due to direct parallel connection, but this is often acceptable. For ultimate performance, the Eliminator can be used in place of the parallel solenoid if desired. The solenoid does have the advantage, however, of permitting loads to be drawn from the starter battery when the alternator is charging. For RV's, in-

cluding fifth-wheel rigs, this system is recommended, since the alternative of re-wiring all loads to the house bank isn't attractive.

Fifth Wheel Compatible

Note that when the fifth-wheel tow vehicle is disconnected, the Next Step Regulator must sense the starter battery, instead of the house battery. This is done automatically by installing a simple relay in the system.

Halogen Lamp Protection

The Next Step Regulator has an input that prevents high absorption voltages whenever headlights (or other halogen lights) are on. This will prevent premature failure of the lights. For RV's, and many marine applications, the Next Step System is a logical choice.

