Journey 371 100/240 VAC, 70 W, 110 W
AE10 Med SleepEash 2 104 w
53 W
EUT 40 W
Curasa 550 battery
Dian Dincin, Buchman, The Complete Guide to Natural Sleep, 730
Extra tissue in the back of the though airway such as 120
Power Transcend Multi Night 832 100/240 VAC, 90 W
640 Power BreathX 424 416 Continuous Positive Airway Pressure.
728 ICON 360 100/240 VAC, 100 W
Autoset Parker, James, and Parker, Phillip, Official Patient’s SourceBook 13.4 VDC, 45
Humidifier and heater hose.
100/240 VAC, 5.2
BPS 420 106 70 W
180 40 710 AirMini Power
200 CPAP
The tongue falling back and closing on the airway.
12 VDC, 14 W, DC port
120 VDC, 14 W, DC port
What is Sleep Apnea
Sleep Apnea is a serious potentially life
continues supply of electricity to keep the machine
people stop breathing in their sleep from 5 to 90 times an hour. There are two
types:
• Central Sleep Apnea, CSA, is when breathing is interrupted by improper signals from the brain.
• Obstructive Sleep Apnea, OSA, is when the throat airway closes off the air flow to the lungs.

Sleep Apnea is caused by several reasons:
• Extra tissue in the back of the throat airway such as large tonsils.
• Decrease in the tone of the muscles holding the airway open.
• The tongue falling back and closing on the airway.
• Signals from the brain not triggering the lungs to constrict or expand to exchange air.

Sleep Apnea Treatment
A sleep study determines the extent of the problem where you are monitored while sleeping and body function are measured. The most widely used treatment is with a breathing machine of three different types.
CPAP – Continuous Positive Airway Pressure. APAP – Automatic Positive Airway Pressure. BIPAP – BiLevel Positive Airway Pressure.

Also, there are other devices used, but not as often, such as TAP – Thornton Adjustable Positioner Oral appliance mouth device

Battery Pack and Solar Devices

<table>
<thead>
<tr>
<th>Model name</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICON Premo</td>
<td>100/240 VAC, 24 VDC,150W</td>
</tr>
<tr>
<td>AirMini Autoset</td>
<td>100/240 VAC, 63.6 W, 1 W</td>
</tr>
<tr>
<td>21 Overnight</td>
<td>100/240 VAC, 150 W, Battery</td>
</tr>
<tr>
<td>BreathJourney</td>
<td>100/240 VAC, 40W, 12 VDC 11.5</td>
</tr>
<tr>
<td>AE10 Med Everest 2</td>
<td>40 W, 11.5 VDC, 60 W charger</td>
</tr>
<tr>
<td>Curasa EUT</td>
<td>100/240 VAC, 100 W, DC port</td>
</tr>
</tbody>
</table>

Travel/Oversight Machines

<table>
<thead>
<tr>
<th>Model name</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>XT FX</td>
<td>120 VAC, 35W, 10W, 100/240 VAC, 60 W</td>
</tr>
<tr>
<td>ICON Premo</td>
<td>100/240 VAC, 150 W</td>
</tr>
<tr>
<td>AirMini Autoset</td>
<td>100/240 VAC, 110 W</td>
</tr>
<tr>
<td>SleepRite90</td>
<td>100/240 VAC, 190W, 190W</td>
</tr>
<tr>
<td>Dream Station</td>
<td>100/240 VAC, 110 W</td>
</tr>
<tr>
<td>S9 Escape</td>
<td>100/240 VAC, 70 W, 110 W</td>
</tr>
<tr>
<td>S9 Elite</td>
<td>100/240 VAC, 110 W</td>
</tr>
<tr>
<td>Sleep Style 604</td>
<td>100/240 VAC, 90 W</td>
</tr>
<tr>
<td>AirMini Autoset</td>
<td>100/240 VAC, 100 W</td>
</tr>
</tbody>
</table>


Photovoltaic Technology
Photovoltaics (solar electric) is an environmentally benign, quiet, inefhaussable source of electrical energy. Photovoltaic cells convert sunlight directly to electricity by converting one form of energy into another. Solar-powered equipment requires no fuel, so the length of operation poses no problem when the system is properly designed. Solar energy is a viable, cost effective source of power that can meet most energy needs.

Typically, each system contains PV module(s), charge controller, battery, various electrical safety devices, power distribution devices, and an inverter(s). The PV modules produce DC power which the inverter converts to AC power or ‘household’ power. Systems provide AC voltages from 120 to 480 to match the utility to most equipment requirement. Systems are designed to meet equipment loads ranging from a few watts to mega watts. Portable systems can provide 200 to 10,000 watts and home mounted systems can provide 1,000 to 10,000 watts.

PV modules are assembled into systems to produce various power and energy outputs. Stand-alone systems are not connected to the utility grid and operate in remote locations and small energy systems within the system correction. Utility grid tied systems depend on the utility generator to produce electricity and transfer energy between the grid and the PV systems. Grid-tied systems do not operate if the utility is not working. Utility interactive PV systems are bimodal in configuration combining both stand-alone and grid interaction designs. Hybrid designs integrate other renewable sources into the PV system.

When the power goes out, you may want to keep the refrigerator running, lights on and be able to operate a radio or small television for the latest news. But, most importantly, your special needs life support equipment, your CPAP machine.

Real Life Example
The author, has over 30 years of experience with solar energy. Now, dealing with sleep apnea has come to appreciate the needs of people with health issues as can be seen in this picture. His solar power home with storage that operator continuously during power outages. His portable PV generator can also power his CPAP machine.

Conclusion
Many people suffering from Sleep Apnea depend on CPAP machines and a continuous supply of electricity. Inevitably, disasters, accident, storms and other factors cause utility power outages. Gasoline generator have their problems too. Times are changing as interest in solar increases and the solar industry grows. PV systems are being installed on increasing numbers of small businesses, hospitals and homes. Not only can PV be integrated into buildings as a source of power, but also as a critical power supply in the event of a power outage and operates like a Uninterruptable Power Supply, UPS.

Portable solar power systems or solar powered homes are a viable solution to power outages for people suffering from sleep apnea. American power utilities have done a huge job to provide reliable electricity but still there are power outages. The use of battery power CPAP machines is another solution during power outages. People suffering from Sleep Apnea have put lot of efforts to overcome their health issues and solar is one solution.

References
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• Dan Dixon, Buchman, The Complete Guide to Natural Sleep, Gramercy, 2005
• Parker,James, and Parker, Phillip, Official Patient’s Sourcebook on Sleep Apnea, Icon Group International, 2002.