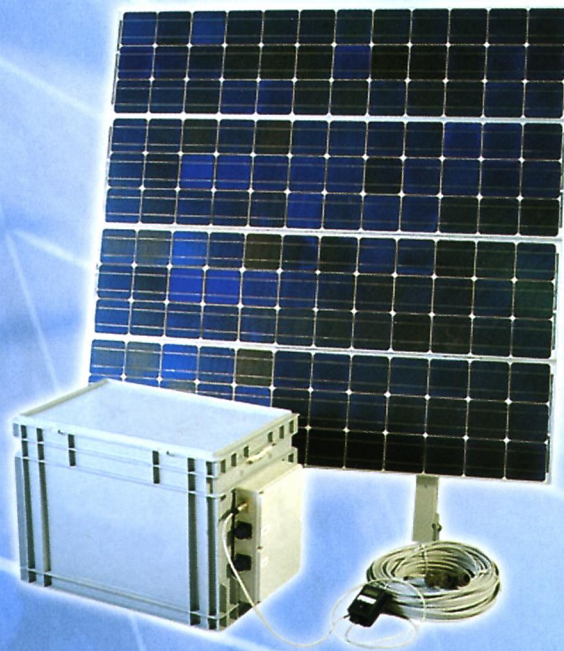


Naps Universal Power Pack

Electricity wherever it is needed



Reliable, independent solar power source

Especially designed for emergency and disasters.

Fast and easy installation.

Fast and efficient delivery by air, land or sea.

Standard systems always in stock and available to be flown out in 24 hours or less.



Naps Universal Power Pack

is designed especially for easy transport and installation. A solar energy specialist is not needed for the installation and commissioning as there are extremely clear instructions. Plus the main electrical connections use wires with pre-fitted plugs that only fit one socket in the Power Pack box.

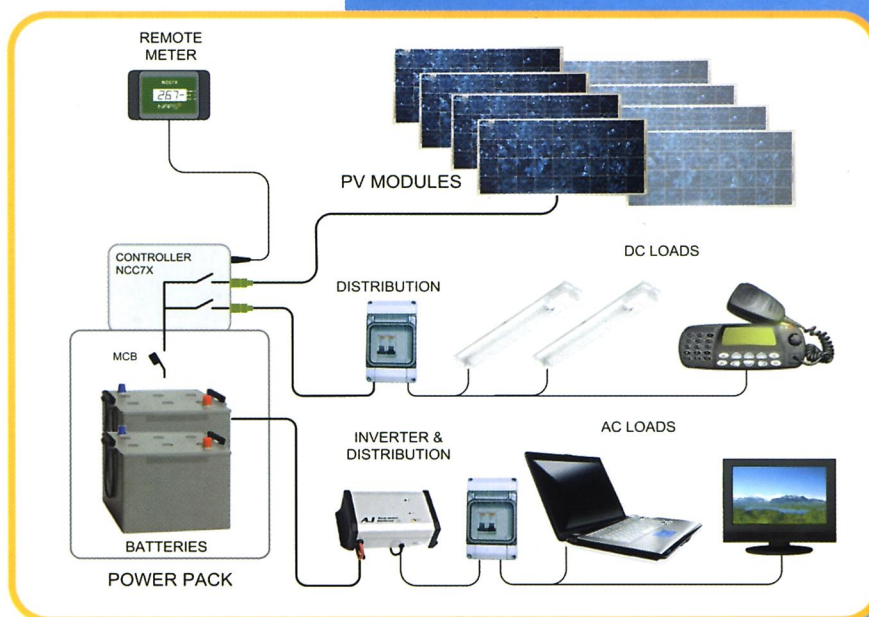
All required components are supplied in the Power Pack: solar modules, mounting structure, cables for interconnecting the solar modules (with pre-fitted connectors and cable glands), batteries and their interconnections, battery box for 1 or 2 batteries with integral charge controller and connection sockets, remote meter / display, 50m of special cable with the required connectors fitted at each end. Installation simply involves connecting and mounting the solar modules and structure on a suitable flat base, then cutting the special cable so that one part connects the solar array to the Power Pack box and the other part connects the Power Pack box to the load(s). Even Electrical sundries like cable ties, cable clips and insulation tape are provided.

During the day, the solar modules charge the battery as well as providing power to the equipment. At night, the batteries can release the solar energy stored during the day.

The standard Power packs are all configured to run 12 volt equipment. Special versions are also available for 24 volt equipment. Suitable 230 volt AC equipment can also be operated when an optional DC to AC inverter is supplied.

Different sizes of Power Packs are available depending on the electrical load requirements. The standard versions are supplied with "sealed" lead-acid batteries of the gel type which can be safely transported by air, truck or boat. These batteries are suitable for use in hot climates.

In larger Power Packs with more than 2 batteries, additional battery boxes are supplied.



Code	Name	Modules	Battery	Battery boxes	Array mounting	Shipping details dimensions cm + weight
Mini PP-50-W/R	Mini Power Pack 50 Wp	1 x 50Wp	1 x 60Ah, 12V	1	wall or roof	105 x 60 x 54, 60 kg**
Mini PP-100-W/R	Mini Power Pack 100 Wp	2 x 50Wp	1 x 115Ah, 12V	1	wall or roof	105 x 60 x 54, 80 kg
Mini PP-100-G	Mini Power Pack 100 Wp	2 x 50Wp	1 x 115Ah, 12V	1	ground	158 x 71 x 54, 90 kg
PP-200	Universal power pack 200 Wp	4 x 50Wp	2 x 115Ah, 12V	1	ground	158 x 71 x 54, 172 kg
PP-260	Universal power pack 260 Wp	2 x 130Wp	2 x 115Ah, 12V	1	ground	158 x 71 x 63, 180 kg
PP-390	Universal power pack 390 Wp	3 x 130Wp	4 x 115Ah, 12V	2	ground	158 x 71 x 63, 165 kg
PP-780	Universal power pack 780 Wp	6 x 130Wp	8 x 115Ah, 12V	4	ground	2 x 158 x 71 x 63, 2 x 165 kg

** crate can contain two systems

Each system is packed separately in UN-approved, stackable plywood crates suitable for sea, land and air transport. The packing is re-usable if the system has to be moved to another location later on.



Purpose-Designed and Field Proven

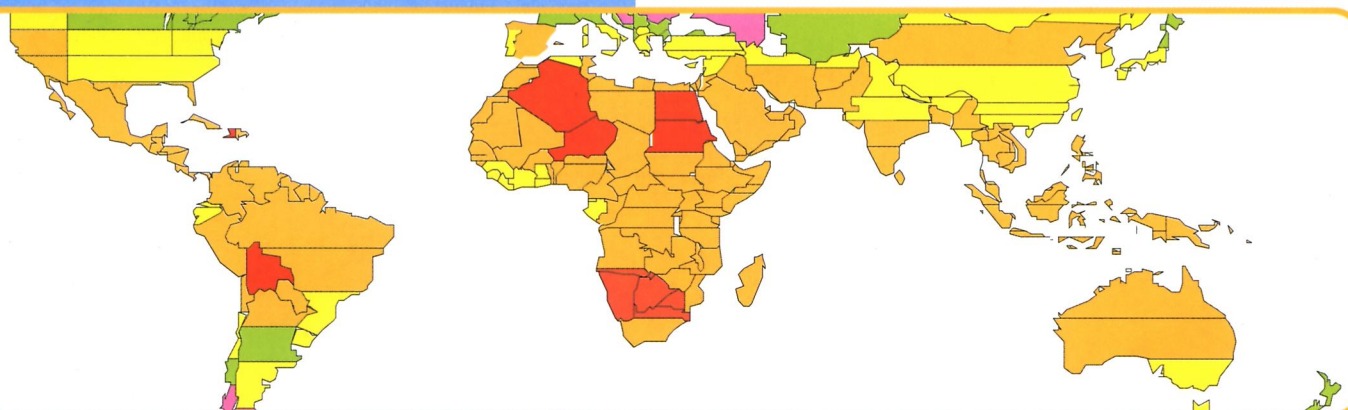
Developed originally for the Naps Camel Fridge for storing vaccines, and subsequently developed for emergency relief for UNHCR and other UN organisations, the Naps Universal Power Pack is a complete solar power system that is especially designed to be delivered and installed quickly.

Naps Universal Power Pack is suitable for permanent installation in remote areas for schools, health centres, etc., as well as providing a temporary power source in refugee camps and disaster areas.

Normally designed to power 12 volt DC loads like lighting, telecommunications, vaccine refrigerators, etc, the Universal Power Pack can also be supplied with an inverter to power AC equipment at 230V.

Naps Systems is a leading supplier of off-grid solar power systems with a track record of over 25 years. Naps Universal Power Pack has been supplied for over 15 years to numerous customers, such as governmental and non-governmental aid and relief organizations, as well as many UN organizations. Recent satisfied customers include Unicef, UNDP, WFP, WHO and UNHCR.

Guide to size of Power Pack Needed



Minimum available Watt-hours per day, worst month of the year.
Refers to lowest radiation site in the climate zone.

Zone	PP-50	PP-100	PP-200	PP-260	PP-390	PP-780
A	180	350	700	900	1350	2710
B	140	280	560	720	1080	2160
C	110	210	420	540	810	1620
D	70	140	280	360	540	1080
E	40	70	140	180	270	540

The table and map show the minimum number of Watt-hours of DC electricity at 12 volts which the different sizes of Power Pack can provide in the sunnier parts of the world. To estimate your requirement, multiply the Watts of each 12V device by the hours per day they will be used and add all these figures together. For 230V AC devices, add 10% to allow for losses in the optional inverter. Then check your intended location on the map and look up in the table which system can provide at least this amount of electricity.

Example 1

- 5 fluorescent lights, 12V, 18 Watts needed for 6 hours / day = $5 \times 18 \times 6 = 540$ Wh / day
 - 1 small pump, 12V, 50 Watts needed for 1 hour / day = $1 \times 50 \times 1 = 50$ Wh / day
 - 1 radio, 12V, 10 Watts needed for 10 hours / day = $1 \times 10 \times 10 = 100$ Wh / day
- Total requirement is $540 + 50 + 100 = 690$ Watt hours / day -> **Zone A:** PP-200 **Zone B:** PP-260, **Zone C:** PP-390

Example 2

- 2 fluorescent lights, 12V, 10 Watts needed for 2 hours / day = $2 \times 10 \times 2 = 40$ Wh / day
 - 2 way radio, 230V AC, 100W transmit for 2 hours, 10W receive for 2 hours, 3W standby for 20 hours = $(100 \times 2) + (10 \times 2) + (3 \times 20) = 280$ Wh / day at 230V, add 10% for inverter losses = $280 \times 1.1 = 308$ Wh / day
- Total requirement is $40 + 308 = 348$ Watt hours per day -> **Zone A:** PP-100, **Zone B or C:** PP-200, **Zone D:** PP-260

These tables and examples are for guidance only. Please check your exact requirements with Naps Systems before ordering.

Specifications may change due to Naps policy of continuous product improvement. Please check current specification before purchasing.