



**Home, Cabin and Lodge
Power Systems**

2010 Catalogue



We are a technically orientated company. All our systems are thought out and designed based on the specifications of each product and its compatibility with all the components used.

**Our goal is to give you, the client,
the best products and services we can provide.**

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Prices and products in this catalogue are subject to change without notice.

All prices are in Canadian funds and FOB Kelowna, BC Canada

All prices subject to applicable taxes and levies.

We follow a strict code of conduct protecting your right to privacy.

www.switchenergy.ca

Why We Are Different

At Switch Energy Inc., we strive to provide the latest and most up-to-date products available in the industry. We are continually researching products and discussing with our suppliers new and innovative ways to approach power solutions.

We have the knowledge and expertise to custom design a system specifically to meet your needs and incorporate what power sources you have available to you—solar, wind, hydro, or generator. We can design a system using one or all of your power sources to provide your home or business with safe reliable electricity day-in and day-out. In addition, we have the equipment to do a proper site check before designing your system. This ensures whichever is used, be it solar, wind and/or hydro, it is the most viable and practical solution to your power requirements.

Solar pathfinder



If we told you we could increase your solar panels efficiency by up to 30% just by adding one low cost component, would you be intrigued and interested? Read all about MPPT technology on page 4 and judge for yourself.

Would you buy and drive a car without a gas gauge? No, of course you wouldn't! That's why we use a variety of metering systems, depending on the size and how much information the customer needs to know regarding the day to day operation of the system ("amp-hours used", "battery percent full", "monitors solar arrays", etc.) Look for the BMK, TriMetric and PentaMetric on pages 10 & 11.

When planning a stand-alone residential/cabin/lodge system, a careful analysis of the household power consumption needs to be made. We have made this easier for you by including a Power Consumption Table and a worksheet on pages 12 & 13 called "Lets Size Your System".

With so many different systems available, we take the time to discuss your needs so you can make the best informed choice. You will get the system that is right for you!

We use only pure sine wave inverters in our systems so all your electronic devices will work - **guaranteed!**

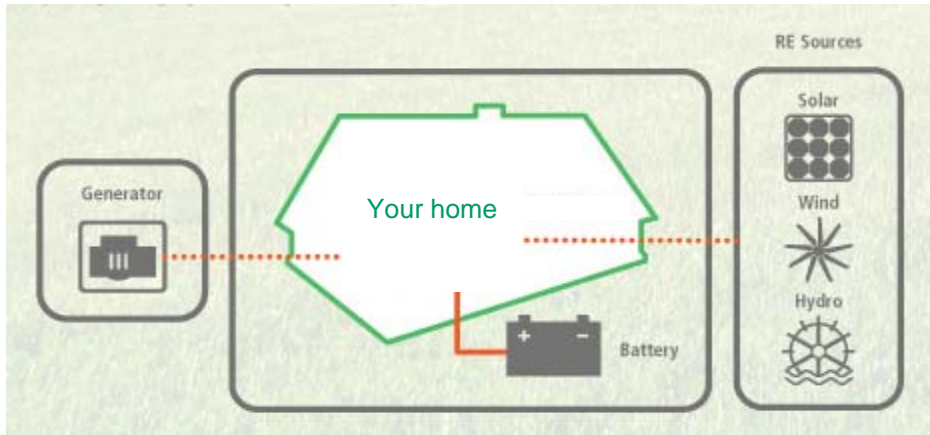
All our prices are landed cost to Kelowna, BC Canada. There are no extra charges such as brokerage, duty, etc. added (only the applicable taxes & levies).

For years we have had the mind set that to live "off the grid" we would have to listen to a generator or do without modern conveniences. Thankfully, this is no longer the case. Our systems vary from basic lighting to being able to provide power to a fulltime lodge. The money saved by not having to run a gas or diesel generator fulltime is worth the investment, not to mention the negative impact generators have on the environment. Solar and inverter power systems are virtually maintenance free and quiet. We also provide installation service. Wind and hydro systems are available for those who have this natural resource.

OUR SYSTEMS WORK!!

Power Systems Explained

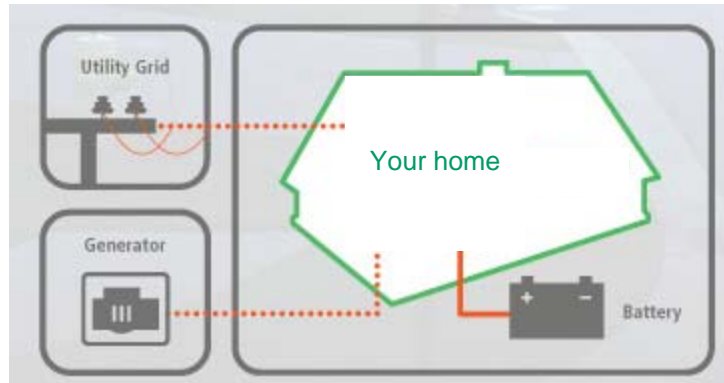
Off Grid System



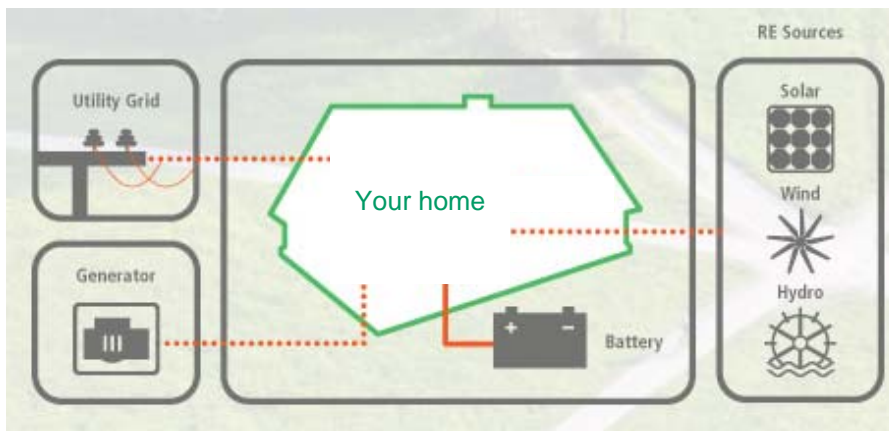
Our off grid systems will provide your home with a completely autonomous supply of electricity. Most systems use solar arrays, but a wind generator, micro-hydro generator, and/or a fuel generator can also be incorporated into our systems.

Backup Power System

Grid connected homes can benefit from having a backup power system. When a power failure occurs, the inverter will automatically detect it and instantly switch to the backup power stored in the battery bank. When the grid power comes back on, the batteries will then be recharged and ready for the next power failure. Imagine being the only home on the block with power.



Grid-Tie System with Backup Power



This system is for homes that are connected to the grid, and want to incorporate a renewable energy (RE) system with backup power. A grid-tie system allows any excess energy that is generated to be sold back to the utility company, and allows the grid to act as an additional energy source to charge the systems batteries. If the grid should fail, the inverter will automatically supply energy from the batteries and the RE sources, to support your homes electrical needs.

About Batteries, Inverters, DC to AC

Lead Acid Batteries

Using an electrolyte consisting of sulphuric acid, a battery can store impressive amounts of electrical energy in a relatively small space. This energy is stored in chemical form within lead grids mounted inside the battery. Currently, there are three common lead-acid battery technologies: Flooded, Gel and AGM. We prefer to use Gel or AGM batteries in all our systems, and here is why.

- **AGM** stands for Absorbed Glass Mat, a newer type of battery construction that uses saturated absorbent glass mats. AGM batteries are sealed and therefore require no maintenance. This also means no acid spills, gassing, watering or an equalization process to contend with.
- **Gel** batteries use a thickening agent like fumed silica to immobilize the electrolyte. If, by chance, the battery container cracks or is breached, the battery will continue to function. As with the AGM battery, the Gel cell is sealed and user friendly as well.
- **Flooded** batteries are the most common lead-acid battery-type in use today. However, they do require maintenance on a regular basis. Along with the need to have the electrolyte solution topped up, specific gravity checks done with a hydrometer, an equalization process performed, they also need a specially built container or a separate ventilated room as they “off gas” (produce toxic fumes). Since the battery is not sealed, great care has to be used when working with these batteries as the electrolyte (sulphuric acid) will burn your skin!

More food for thought:

- Flooded cells can lose up to 12% per month due to self-discharge while AGMs and Gel cells lose only 1-3% per month.
- AGMs have a higher charge efficiency which allows you to recharge in less time. Flooded cells convert 15-20% of the electrical energy into heat instead of potential power. Gel cells typically lose 10-16% while AGMs as little as 4%.



Sealed Batteries

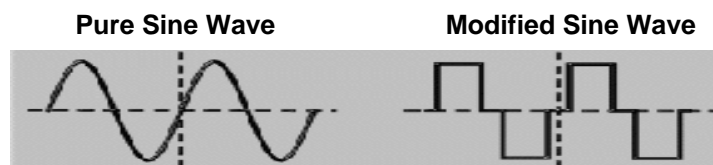


Inverters

An inverter is an electronic device that converts DC electricity, which is stored in your batteries, into AC electricity which you use to run typical household appliances such as microwaves, TV's, computers, lights, etc.

There are two types of inverters: the modified sine wave and the pure sine wave. Due to technological advances made in the electronics industry over the past few years, some appliances such as microwave ovens and TV's can be very sensitive to the modified sine wave and will not run. You may also notice a buzzing or humming sound coming from the modified sine wave inverter when it is under load.

Whereas a pure sine wave inverter provides power that is exactly like the power produced by the utility company and therefore capable of running all electronics.



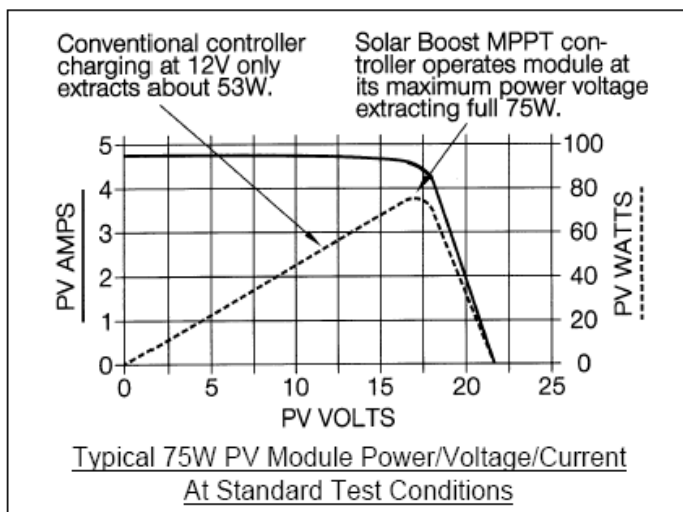
What Is MPPT and Why We Use It

MAXIMUM POWER POINT TRACKING

MPPT charge controllers increase charge current by harnessing more PV (photovoltaic) power. A conventional charge controller simply connects the PV module (solar panel) to the battery. When the battery is discharged, it will limit how much power a PV module can deliver. MPPT technology operates the PV module at its optimum voltage where it can produce the greatest amount of power rather than at battery voltage. The greater amount of power harnessed from the module is then provided to the battery as increased charge current.

The actual charge current increase you will see varies primarily with module temperature and battery voltage. In comfortable temperatures, power increase typically varies between 10 to 25%, with 30% or more easily achieved with a discharged battery and cooler temperatures.

The MPPT charge controllers we use also have temperature compensation to properly adjust the voltage for the batteries. This increases battery life and charging efficiency.



Be Cost Effective With MPPT

Using MPPT will save you money by gaining up to 30% more power from your solar panels.

For example:

If you take a 130 watt solar panel with a standard regulator, you will typically get between 90 to 100 watts depending on the battery voltage.

The same 130 watt panel with a MPPT charge controller, will capture and utilize the missing power, giving you the maximum efficiency of your panel and the best ratio of dollar per watt.

Why would you pay for a 130 watt panel and settle for only 90 watts of power from it? It just doesn't make sense! The increased wattage more than off sets the additional cost of the MPPT.

Sun Hours Per Day

Several factors influence how much sun power your modules will be exposed to:

When you will be using your system—summer, winter, or year-round.

Typical local weather conditions.

Fixed mountings vs. trackers.

Location and angle of PV array.

We have provided the following chart which shows ratings that reflect the number of hours of full sunlight available to generate electricity. Your solar array's power generation capacity is dependant on the angle of the rays as they hit the modules. Peak power occurs when the rays are at right angles to the modules.

If you use your system primarily in the summer, use the summer value: if you are using your system year-round, especially for a critical application, use the winter value. Using the chart, you should be able to determine a reasonable estimate of the sun's availability in your area.

Province, City	Summer Avg.	Winter Avg.	Yr Round Avg.
Alberta, Edmonton	4.95	2.13	3.75
Alberta, Suffield	5.19	2.75	4.10
British Columbia, Kamloops	4.48	1.46	3.29
British Columbia, Prince George	4.13	1.33	3.14
British Columbia, Vancouver	4.23	1.33	3.14
Manitoba, The Pas	5.02	2.02	3.56
Manitoba, Winnipeg	5.23	2.77	4.02
New Brunswick, Fredericton	4.23	2.54	3.56
Newfoundland, Goose Bay	4.65	2.02	3.33
Newfoundland, St. Johns	3.89	1.83	3.15
Northwest Territory, Fort Smith	5.16	0.88	3.29
Northwest Territory, Norman Wells	5.04	0.06	2.89
Nova Scotia, Halifax	4.02	2.16	3.38
Ontario, Ottawa	4.63	2.35	3.70
Ontario, Toronto	3.98	2.13	3.44
Prince Edward Island, Charlottetown	4.31	2.29	3.56
Quebec, Montreal	4.21	2.29	3.50
Quebec, Sept-Isles	4.29	2.33	3.50
Saskatchewan, Swift Current	5.25	2.77	4.23
Yukon, Whitehorse	4.81	0.69	3.10

About Kyocera Solar Panels

Kyocera High Efficiency Multi-Crystal Solar Panels The KD135 and KD205

Highlights:

Kyocera's advanced cell processing technology and automated production facilities produce a highly efficient multi-crystal solar panel. The cells are encapsulated between a tempered glass cover and a back sheet to provide efficient protection from the severest environmental conditions. The entire laminate is installed in an anodized aluminum frame to provide structural strength and ease of installation.

Applications:

- Power source for summer vacation homes
- Microwave/Radio repeater stations
- Emergency communication systems
- Aviation obstruction lights
- Water quality & environmental data monitoring systems
- Pumping systems for irrigation & livestock watering
- Navigation lighthouses & ocean buoys
- Etc.



Quality Assurance:

- **Kyocera multi-crystal photovoltaic modules exceed government specifications for the following:**
- Thermal cycling test
- Thermal shock test
- Thermal freezing & high humidity cycling test
- Electrical isolation test
- Hail impact test
- Mechanical, wind & twist loading test
- Salt mist test
- Light & water exposure test
- Field exposure test

Kyocera has been building quality modules since 1975.
Now manufactured in North America.
cUL Listed

Solar Panel Spec's		KD135	KD205
Rated Power	watts	135	205
Current at Max. Power	amps	7.63	7.71
Voltage at Max. Power	volts	17.7	26.6
Short Circuit Current	amps	8.37	8.36
Open Circuit Voltage	volts	22.1	33.2
Maximum System Voltage	volts	600	600
Length	inches	59.1	59.1
Width	inches	26.3	39.0
Depth of Frame	inches	1.8	1.8
Weight	lbs	27.5	39.7
Warranty on Power Output	years	20	20

Magnum Energy Inverter/Chargers

The MS Series Inverter/Charger

The MS Series Inverter/Charger—A **pure sine wave** inverter designed specifically for the most demanding mobile and off grid applications. Run your TVs, stereos, plasma screens, and other sensitive electronics without worry.

The cost effective pure sine wave inverter/charger provides clean, reliable power with a low total harmonic distortion (THD) of less than 5%.

Magnum Energy's PFC (Power Factor Corrected) charger is built into all of their inverters. It uses less energy from a generator than a standard charger - using only 15 amps vs. 23 amps used by standard chargers.

New from Magnum Energy— Off Grid living with a 120/240 volt inverter/charger. With this inverter you can run any 240 volt load, such as a well pump. It has never been easier or more cost effective!



The MS-AE Series Inverter/Charger

Introducing the MS-AE 120/240V Series Inverter/Charger from Magnum Energy - a pure sine wave inverter designed specifically for the most demanding renewable energy applications. The MS-AE Series is powerful, easy-to-use, and best of all, cost effective.

No stacking required: The unique design of the MS-AE Series can provide 120 or 240 volt output in one unit, eliminating the need to stack two units together to get 240 volts.

The MS-AE Series is ETL listed to the stringent requirements of UL 1741 and CSA C22.2 No. 107.1-01 for Renewable Energy installations.

Outback Products

FM60 & FLEXmax 80 Charge Controllers

Outback's innovative MPPT technology ensures that your solar array is operating at its peak power point regardless of age, shading or environmental conditions—increasing the performance by up to 30%.



Sealed FX Series Inverter

The OutBack pure sine wave inverter/charger is a complete power solution. It incorporates a DC to AC sine wave inverter, battery charger and AC transfer switch housed within a die-cast aluminum chassis. Intelligent multistage battery charging runs your generator less, and prolongs the life of your batteries.

The sealed FX Inverter is ideal for use in coastal environments where corrosion from the salty air may be a concern.



Sealed FX Inverter

Features:

- Pure sine wave output
- Intelligent battery charging
- Modular system architecture
- High operating efficiency
- "Bug Proof" chassis
- Corrosion resistant internal components
- Field serviceable
- Integrated network communications
- Standard 2 year limited warranty

Xantrex XW System

The Xantrex XW System is a fully-integrated, battery-based system, designed for residential and commercial solar and backup power applications. Engineered using a complete systems approach, the XW System stands out from its competition, with a reliable, clean, compact design and integrated balance-of-systems components. The Xantrex XW System is fully expandable with up to 3 inverters, 4 charge controllers, or other equipment to support larger systems, including 3 phase.

XW Hybrid Inverter/Charger

The XW Hybrid Inverter/Charger is a true sine wave inverter/charger that can be used for both residential and commercial applications; stand-alone, grid back-up, and grid-tie with battery energy storage. Capable of being grid-interactive or grid-independent, the XW Series will operate with generators and renewable energy sources to provide full-time or back-up power.



XW Solar Charge Controller



XW System Control Panel



XW Hybrid Inverter/Charger

Features:

- Integrated balance-of-systems components
- 120/240 volt split-phase operation and true sine wave output
- Unsurpassed surge capacity - innovative Full Digital Control regulates voltage to prevent a drop during a power surge
- Efficient, power factor corrected, high current, multi-stage battery charging
- Certified UL and CSA for utility-interactive applications
- Easy and inexpensive to install
- Local display on inverter shows output power, charge current and battery level, to provide system status at a glance
- Designed for easy field installation with manageable building blocks

Battery System Monitors

The TriMetric

Measures Battery Volts, Amps, Amp-Hours, Battery Percent Full, and Five Other Data Functions



If your cottage or cabin depends on batteries for electrical power, here's why a battery system monitor should be a part of your electrical system.

Reliability, accuracy and simplicity are key product objectives.

CONSERVATION

Helps save valuable Energy by letting you see how much you're using.

- Use "amps" to educate users about how much energy different electrical loads draw
- Check that all loads are really off when you think they're off
- Check for "phantom loads" - small loads that steal power 24 hours per day
- Keep informed about how much energy you have left in your battery system
- Reduce generator use by knowing when you can efficiently shut it off because batteries are approaching full charge

BATTERY CARE

Provides information you need to protect your battery investment.

- Know when to turn on your generator to avoid damage from over discharge
- Check that charging systems are charging to correct voltage for longest life
- Be reminded not to let batteries go too many days between a full charge

SYSTEM MAINTENANCE

Helps locate system problems when they occur.

- Monitor solar arrays and inverter/chargers to be sure they are still charging at proper rates and voltage
- Find out if batteries are still holding energy properly
- Even if you're not an expert, a dealer or other knowledgeable person can more easily help you "by phone" to locate a problem if you have a monitor on your system



Battery System Monitors

BMK from Magnum Energy

Monitoring your battery bank is easy with the Battery Monitor Kit (ME-BMK) from Magnum Energy. Acting as a “fuel gauge” for your batteries, the ME-BMK monitors their state of charge (SOC) and then provides this information in an easy-to-understand display via the ME-RC remote. With accurate SOC readings, you can avoid unnecessary battery recharging, saving on fuel and long-term maintenance costs.

Available readings from the ME-BMK

- State of Charge (SOC) 0 - 100%
- DC volts
- DC amps
- Amp hours in/out
- Resettable amp hours out
- Total amp hours out
- Minimum volts DC
- Maximum volts DC
- Temperature compensated
- Auto detects input voltage



PentaMetric

We like to use the PentaMetric on our larger systems as it offers a lot more capability than the TriMetric monitor. It can measure 1 or 2 battery systems with a common negative. With one battery system, battery current plus two charging sources/loads can be measured.

Features:

- Complete system consists of 3 parts: Input unit (near batteries), Display unit (shown here) and Computer interface unit
- Monitor up to 3 shunts - Ex: measure total solar input and wind input independently in addition to monitoring battery “state of charge”
- Access the data with display unit up to 1000 ft from the batteries
- Optional computer interface with (Windows) software to control and read out all data
- Extensive system logged data
- Relay output to control generator or external alarm
- Audible and visual alarms for high and low battery conditions



Lets Size Your System

Power Consumption Table

These figures are approximate representations. The actual power consumption of your appliance may vary substantially from these figures depending on its age. Where a range of numbers are given, the lower figure often denotes a technologically newer and more efficient model. Check the power tags, or better yet, measure the amperage draw with a clamp-on ammeter or plug in a [Kill-a-Watt](#) measuring device.

Item	Watts	Item	Watts	Item	Watts
Coffee Maker	800	Iron	800	Garage Door Opener	350
Toaster	800-1500	Clothes Dryer (Gas Heated)	300-400	Table Fan	10-25
Blender	300	Air Conditioner (Room)	1000	Blow Dryer	1000
Waffle Iron	1200	Popcorn Popper	1250	Waterpik	100
Frying Pan	1200	Microwave	600-1500	Computer (Laptop)	20-50
Vacuum (hand)	100	Dishwasher	1200-1800	Coffee Pot	500
Washer (Automatic)	500	Vacuum (Upright)	500-1500	Hot Plate	1200
Furnace Blower	300-1000	Sewing Machine	100	Clothes Dryer	4000
Air Conditioner (Central)	2000-5000	Electric Blanket	200	Shaver	15
Ceiling Fan	10-50	VCR/DVD	100	Well Pump (1/3-1 HP)	1200
Computer (Desktop)	80-150	Washer (Wringer)	300	Satellite Dish	125
TV	125			Heater (Portable)	1500

Multiply the hours used on the average day by the wattage listed. This will give you the watt hours consumed per day. Remember that some items, such as garage door openers, are used for only a fraction of an hour or minutes per day. A 300 watt item used for 5 minutes per day will only consume 25 watt hours per day.

We recommend for "off grid" living, the use of propane to operate ranges and hot water heaters as well as changing your lighting to the newer energy efficient compact fluorescent or LED bulbs. We stock 12 V compact fluorescent and LED bulbs.

Lets Size Your System

Load Evaluation Form

Appliance	Qty		Wattage		Hrs. Per Day		Days Per Week	Divide By	=	Avg. Watt Hrs./Day	
Inverter	1	X	25(approx)	X	24	X	7	17	=	600	
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
		X		X		X		17	=		
Highest AC loads in watts:				Total AC connected wattage at one time:				Total watt-hr per day:			
Total watt-hr per day:				X	Load correction factor*			=	Corrected watt-hr per day:		
				X	1.25			=			

How to Use

Multiply corrected watt-hrs per day by the number of days (1 to 7) you plan to be in residence - a weekend retreat or a full time home.

_____ x _____ = _____ This is your total watt hours per week.

Now match your power needs to the appropriate size panels:

Ex. KD135 3780 watt hours/week
 KD205 5740 watt hours/week
 KD135 x 2 7560 watt hours/week
 KD205 x 2 11480 watt hours/week

To find the watt hours a panel will provide, multiply the watts by approximately 4 hours of sunlight per day. The KD135 has 135 watts x 4 hours x 7 = 3780 watt hours per week. This is based on using Maximum Power Point Tracking charge controller technology. The watt hours can vary depending on location and time of year. Refer to "Sun Hours Per Day" chart on page 5.

* The load correction factor is required as batteries are not 100% efficient and other losses occur in a system.

We increase the load value by 25% to compensate for these losses.

Economy Solar Kits

Economy See Food Kit with a Portable Cooler 135 watt System

Great for a quick weekend get-a-way. Load up the food and go.

- 1 Kyocera 135 watt solar panel with roof mounting kit
- 1 Nova Kool 30 liter portable cooler
- 1 Steca PR2020 regulator with light switch
- 1 AGM battery - capacity: 1.4 kWh (120Ah@12V)
- 2 Compact 12V fluorescent lights and light bases
- 30 ft solar wire

Price: \$2,100.00



See Food Kit 135 watt System

Good for running a few lights and keeping the food and beer cold.

- 1 Kyocera 135 watt solar panel with roof mounting kit
- 1 SunDanzer 8 cu ft chest style fridge
- 1 Steca PR2020 regulator with light switch
- 1 AGM battery - capacity: 1.4 kWh (120Ah@12V)
- 2 Compact 12V fluorescent lights and bases
- 30 ft solar wire

Price: \$2,911.00



Economy Weekend Cabin Kit #1 1500 watt inverter with 135 watt solar

Perfect for the occasional weekend get-a-way.

- 1 Kyocera 135 watt solar panel with roof mounting kit
- 1 MPPT regulator charge controller
- 1 Cotek 1500 watt inverter with remote
- 1 AGM battery - capacity: 2.8 kWh (234Ah@12V)
- 1 battery monitor
- 30 ft solar wire
- Preassembled and wired on a mounting board with a safety switch in a junction box

Price: \$3,646.00



Economy Weekend Cabin Kit #2 1500 watt inverter with 270 watt solar array

For the every weekend get-a-way.

Identical to Cabin Kit #1 only this kit comes with:

- 2 Kyocera 135 watt solar panels with roof mounting kit
- 1 Cotek 1500 watt inverter with remote
- 2 AGM batteries - capacity: 4.6 kWh (390Ah@12V)

Price: \$4,670.00



Cabin Solar Kits

Magnum/OutBack 120 Volt Systems

These systems come preassembled and wired on a Magnum Power Panel with all AC/DC breakers and inverter cables, ready to attach to your wall and wire to your AC breaker panel. Just connect your batteries, mount and connect in your solar panels. All systems come preprogrammed and ready to go. Voila! You are done!!

The **pure sine wave** inverters come with a built in charger and transfer relay for easy connection to a generator if needed. These systems give you more watts per solar hour by combining two Kyocera 135 watt solar panels to give you 270 watts each hour with the average of 4 optimum solar hours per day.

See Sun Hours Per Day chart on page 5.

Cabin Kit #1 2000 watt inverter with 270 watt solar array

- 2 Kyocera 135 watt solar panels with roof mounting kit
- 1 MPPT regulator charge controller
- 1 Magnum 2000 watt inverter/charger with remote
- 2 AGM batteries - capacity: 4.6 kWh (390Ah@12V)
- 1 battery monitor
- 1 lightning protector for panels

Price: \$6,211.00

Cabin Kit #2 2800 watt inverter with 270 watt solar array

- 2 Kyocera 135 watt solar panels with roof mounting kit
- 1 MPPT regulator charge controller
- 1 Magnum 2800 watt inverter/charger with remote
- 4 AGM batteries - capacity: 9.3 kWh (780Ah@12V)
- 1 battery monitor
- 1 lightning protector for panels

Price: \$7,690.00

Cabin Kit #3 2800 watt inverter with 540 watt solar array

- 4 Kyocera 135 watt solar panels with roof mounting kit
- 1 MPPT regulator charge controller
- 1 Magnum 2800 watt inverter/charger with remote
- 4 AGM batteries - capacity: 9.3 kWh (780Ah@12V)
- 1 battery monitor
- 1 lightning protector for panels

Price: \$9,253.00



All the cabin kits on this page include 30 ft of solar wire, and the parts necessary to complete your solar installation.

Optional: Pole mount available for 2 panels Price: \$ 378.00
4 panels Price: \$ 540.00

Small Home Solar Kits

Magnum/OutBack Small Home Systems 120 volt

The following 6 systems are designed for homes with moderate power consumption. As with all renewable energy systems, conservation is the key. These systems come preassembled and ready to be installed.

West Coast Cabin System #1 3000 watt inverter with 810 watt solar array

We recommend this kit for coastal areas as it uses a sealed inverter which is not affected by the salt air.

- 6 Kyocera 135 watt solar panels
- 1 MPPT regulator charge controller
- 1 OutBack FX3000 watt inverter/charger with remote
- 4 AGM batteries - capacity: 11.2 kWh (234Ah@48V)
- 1 battery monitor
- 1 lightning protector for the panels
- 1 top of pole mount

Price: \$12,167.00



Small Home Kit #2 4000 watt inverter with 810 watt solar array

- 6 Kyocera 135 watt solar panels
- 1 MPPT regulator charge controller
- 1 Magnum 4000 watt inverter/charger with remote
- 4 AGM batteries - capacity: 9.3 kWh (390Ah@24V)
- 1 battery monitor
- 1 lightning protector for the panels
- 1 top of pole mount

Price: \$11,038.00



Small Home Kit #3 4000 watt inverter with 1080 watt solar array

- 8 Kyocera 135 watt solar panels
- 1 MPPT regulator charge controller
- 1 Magnum 4000 watt inverter/charger with remote
- 8 AGM batteries - capacity: 18.7 kWh (780Ah@24V)
- 1 battery monitor
- 1 lightning protector for the panels
- 1 top of pole mount

Price: \$15,187.00



These kits do not include the pole to mount the panels on or the solar wire to run from the solar array to the system. We have the solar wire available for an additional cost.

Small Home Solar Kits

Magnum Small Home Systems 240 volt

The following systems are 120/240 volt. These are designed to be used with larger 240 volt generators and can easily run 240 volt loads such as well pumps. These systems come preassembled and ready to be installed.

Small Home Kit #4 4000 watt inverter with 810 watt solar array

6 Kyocera 135 watt solar panels
 1 MPPT regulator charge controller
 1 Magnum 4000 watt 120/240 volt inverter/charger with remote
 8 AGM batteries - capacity: 18.7 kWh (780Ah@24V)
 1 battery monitor
 1 lightning protector for the panels
 1 top of pole mount
Price: \$13,830.00

Small Home Kit #5 4400 watt inverter with 1230 watt solar array

6 Kyocera 205 watt solar panels
 1 MPPT regulator charge controller
 1 Magnum 4400 watt 120/240 volt inverter/charger with remote
 8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)
 1 battery monitor
 1 lightning protector for the panels
 1 top of pole mount
Price: \$15,670.00



Small Home Kit #6 4400 watt inverter with 1845 watt solar array

9 Kyocera 205 watt solar panels
 1 MPPT regulator charge controller
 1 Magnum 4400 watt 120/240 volt inverter/charger with remote
 16 AGM batteries - capacity: 37.4 kWh (780Ah@48V)
 1 battery monitor
 1 lightning protector for the panels
 1 top of pole mount
Price: \$23,304.00



These kits do not include the pole to mount the panels on or the solar wire to run from the solar array to the system. We have the solar wire available for an additional cost.

Large Home Solar Kits

Xantrex Large Home System 120/240 volt

These are bigger systems designed for year round home living. If in the future, you find that you require more power, the Xantrex system is fully expandable with the addition of up to 2 more inverters. Additional solar panels can also be added if needed. However, please keep in mind that no matter how big the system, conservation is still the key to problem free living when using a renewable energy source.

Large Home Kit #1 6000 watt inverter with 2460 watt solar array

- 12 Kyocera 205 watt solar panels
- 1 MPPT regulator charge controller
- 1 Xantrex 6000 watt 120/240 volt inverter/charger
- 16 AGM batteries - capacity: 37.4 kWh (780Ah@48V)
- 1 battery monitor with generator start
- 1 lightning protector for the panels
- 2 top of pole mounts

Price: \$30,416.00

GRID-TIE READY!!



Magnum Stackable System 120/240 volt

Large Home Kit #2 8800 watts with 2460 watt solar array

- 12 Kyocera 205 watt solar panels
- 1 MPPT regulator charge controller
- 2 Magnum 4400 watt 120/240 volt inverter/chargers with remote
- 16 AGM batteries - capacity: 37.4 kWh (780Ah@48V)
- 1 battery monitor with generator start
- 1 lightning protector for the panels
- 2 top of pole mounts

Price: \$29,763.00

These kits do not include the poles to mount the panels on or the solar wire to run from the solar array to the system. We have the solar wire available for an additional cost.



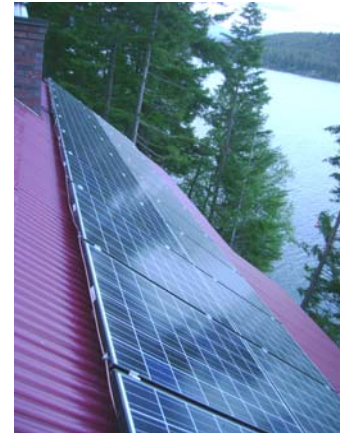
Large Home Solar Kits

Magnum Energy Stackable Systems 120/240 volt

The Magnum Energy stackable products that we use allows your system to grow along with your power needs as the inverters are stackable up to 17,600 watts of 120/240 volt power making them the perfect choice for resorts, lodges, and full time homes. The innovative MPPT technology that we use gets the most from your solar array. The MPPT regulator charge controller can also control hydro or wind turbine charging sources.

Large Home Kit #3 13200 watts with 3690 watt solar array

- 18 Kyocera 205 watt solar panels
 - 2 MPPT regulator charge controllers
 - 3 Magnum 4400 watt 120/240 volt inverter/chargers with remote
 - 16 AGM batteries - capacity: 37.4 kWh (780Ah@48V)
 - 1 battery monitor
 - 1 lightning protector for the panels
 - 2 top of pole mounts
- Price: \$38,909.00**



Large Home Kit #4 17,600 watts with 3690 watt solar array

- 18 Kyocera 205 watt solar panels
 - 2 MPPT regulator charge controllers
 - 4 Magnum 4400 watt 120/240 volt inverter/chargers with remote
 - 24 AGM batteries - capacity: 56.1 kWh (1170Ah@48V)
 - 1 battery monitor
 - 1 lightning protector for the panels
 - 2 top of pole mounts
- Price: \$47,023.00**



At **Switch Energy Inc.**, we have the **expertise** and **knowledge** to design a system specifically to meet your power needs by using the power sources you have available - solar, wind, hydro, or generator. No matter what your energy source, we can build a system to provide your home or business with safe reliable electricity 24/7.

The kits do not include the poles to mount the panels on or the solar wire to run from the solar array to the system. We have the solar wire available for an additional cost.



Water Turbines & Pumps

Water Turbines

Where there is water, there is energy!

You can power a small cabin to the largest resort for a fraction of the cost of other energy sources. Water - harness the power of a clean and renewable energy source!



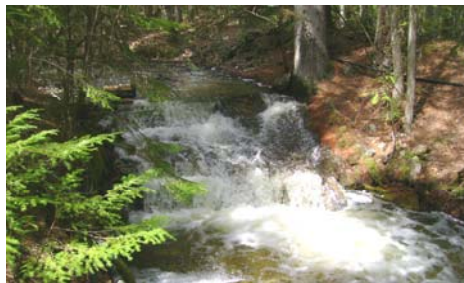
Micro Hydro Systems Explained

The commercial micro-hydro generators available today use a small turbine connected to an electrical generator or alternator. Water is collected in an intake pipe upstream, travels down to the turbine in plastic pipe, and is forced through one or more nozzles by its own gravity pressure. The system includes a regulator charge controller that sends power to the batteries and diverts excess power to prevent overheating.

To decide whether a micro-hydro system will work for you, some measurements and calculations have to be made. First, you need to know the vertical drop in meters (called head), and also the amount of water flow available during different seasons measured in liters per second. The basic formula is:

liters/sec x 10 x vertical drop in meters = theoretical power (usable power is approx. 50% of this #)

The more fall and flow that you have, the more potential power you can generate. Our turbines come with different size nozzles which are designed to be switched in and out as the stream conditions change throughout the year.



Permanent Magnet Turbine

Keep in mind that **a water turbine will produce power 24 hours a day**. We have many makes and models to choose from, so give us a call for more information.



Pump/
Accumulator Combo

Water Pumps

We sell a full line of submersible water pumps that can supply all your water needs. Need water for guests at a resort, irrigation for farming, watering livestock? No problem, we have the pump to get the job done.

[Call for Info and Pricing](#)

Micro Hydro Systems

The Power of Moving Water

If you have the resource available, micro hydro is the least expensive method (in the field of renewable energy) of providing power to your home. Once in place, a system is not difficult to operate or maintain and its lifespan is literally measured in decades. These small hydro systems will typically provide far more power than a solar (PV) system.

For example: Lets say you have measured your creek and you have 3 liters/second flow and the drop is 40 meters. Using the formula on the previous page, you can expect to produce 600 watts continuous. This will yield 14.4 kWh per day!

Small Hydro Kit #1 2800 watt inverter with 700 watt water turbine

- 1 water turbine
- 1 spring box
- 1 manifold
- 1 regulator charge controller
- 1 Magnum 2800 watt inverter/charger with remote
- 2 AGM batteries - capacity: 4.6 kWh (390Ah@12V)
- 1 battery monitor
- 1 dump load

Price: \$7,341.00



Small Hydro Kit #2 4000 watt inverter with 700 watt water turbine

- 1 water turbine
- 1 spring box
- 1 manifold
- 1 regulator charge controller
- 1 Magnum 4000 watt 120/240V inverter/charger with remote
- 4 AGM batteries - capacity: 9.3 kWh (390Ah@24V)
- 1 battery monitor
- 1 dump load

Price: \$8,766.00

These are just a sampling of the many micro hydro kits available.

We can design and install systems ranging in size from 50 to 50,000 watts plus.

The above kits do not include the cost of the pipeline.



Intake box with hydro screen

Wind Turbines

Wind Turbines



We carry a full line of wind turbines and can custom design a system to suit your needs. Also available are tower systems and other wind accessories. However, the question that needs to be asked is...

Do you have enough wind for a turbine?

In order to answer "yes" to this question, you need to feel annoyed by the wind whenever you go outside your home. We are not talking just a light breeze or gusts of wind, we mean really bothered by it! Do your trees look similar to the ones in the pictures? This is called "flagging" and it is because the trees were continually bombarded by wind as they grew. If your trees are like these, then you should have enough wind to make a turbine viable.



Merritt, BC

Wind turbines are available in size ranging from 200 watt to 50 kW.

Call for more info and prices.



Wind Turbine in Merritt, BC

Wind Data Logger



If you are not sure you have enough wind to invest in a turbine, we do have wind data logging equipment for site testing available for rent. We suggest a rental period of a year as that would give enough information to know if a wind turbine is the right solution for you - otherwise you could be left with a very expensive lawn ornament (if there isn't enough wind).

Generators

LIFE...UNINTERRUPTED™



There are many choices when it comes to generators, from small portable gasoline units to prime power commercial diesel generators.

When choosing a generator, it needs to be a part of the overall design, as sizing is important. For most weekend cabins or occasional use, a portable unit will work fine. Full time off grid homes require a standby propane or a prime power rated diesel unit.

Small portable generators are an excellent backup generator for smaller systems. The newer inverter type are much quieter and more efficient than the older type generators. Be sure to get one that is large enough and buy a quality unit. Typical running hours per year is under 250.

Propane standby generators are relatively inexpensive and can work if they are sized correctly and well maintained. Please note - they are designed for intermittent use only and cannot be relied upon for constant power or heavy usage. Check the usage application for warranty coverage, as many are not designed to be used off grid. Typical running hours per year is under 300.



Diesel generators are robust and long lasting. We have seen many that have been well maintained exceed 30,000 hours. The negative side is the cost compared to propane units. They work well for larger homes and lodges and are quite efficient. When considering purchasing, stay with a name brand and be sure to get a prime power unit, as there are a lot of lower grade diesel generators for sale at low prices. Typical running hours per year can be more than 1500 hours plus.

We can supply generators if needed and will help pick the correct unit for the application.

Primary Power Mitsubishi Diesel Generators



30 kW Mitsubishi Generator

We have Mitsubishi diesel generators available in sizes from 11 kW to 30 kW

Call for more info.



16 kW Mitsubishi Generator

Fridges and Freezers

SunDancer Fridges and Freezers

Save on system costs with SunDancer battery-powered solar refrigerators and freezers. Low energy consumption is the key that allows SunDancer refrigerators and freezers to be cost effectively powered from solar, wind, fuel cells or batteries. This technology allows refrigeration in remote locations where it was previously unavailable or prohibitively expensive. A zero maintenance, brushless, thermostatically controlled DC compressor operates on 12 or 24 VDC. A patented low-frost system reduces frost and moisture build-up for low maintenance. These chest-style refrigerators and freezers are easy to clean using the drain hole at the bottom of the unit. With thick insulation and a refrigeration system optimized for solar, SunDancer refrigerators and freezers provide outstanding economical and reliable operation. SunDancer cabinets are commercially produced by one of the world's leading appliance manufacturers.

Features:

- Runs on a single 75 watt solar panel in most climates
- 12 or 24 VDC with low voltage disconnect for battery protection
- Environmentally friendly CFC-free refrigerant (R-134a)
- Rugged scratch resistant galvanized steel exterior
- Thick polyurethane insulation
- Easy to clean aluminum interior
- Patented low-frost system
- Automatic control with adjustable thermostat
- Baskets for food organization

5.8 cu ft also available. Call for pricing.



8.0 cu ft

SunDancer DCR-225
SunDancer DCF-225
Price: \$1499.00

NOVA KOOL Ultra Efficient Portable Coolers

We tested a well known brand name cooler to see how the Nova Kool cooler compared. As a fridge (3 deg C), the Nova Kool used only 120 watt hours in 24 hours and as a freezer (-16 deg C) it used 260 watt hours in 24 hours - tested without the insulated cover. Theirs, on the other hand, used a whopping 600 watt hours in 24 hours. That is 5 times the consumption!! Granted the Nova Kool is more expensive, however you do not need 5 135 watt solar panels to run it! We also found that the brand name cooler did not have a temperature control so it ended up freezing the food - not good for the fruits and vegetables.

Features:

- Can be operated as either a fridge or a freezer
- Strong corrosion resistant cabinet
- Electronic temperature control and readout
- Three convenient sizes
- 30-45-60 Liters internal volume



BCD30 Price: \$791.00
BCD45 Price: \$860.00
BCD60 Price: \$959.00

AC/DC Adaptor
Price: \$84.00



Insulated Cover
Price: \$38.00

Optional accessories:

- Insulated cover
- AC/DC Adaptor

2 year Warranty

Fridges & Freezers

NOVA KOOL Fridges & Freezers

Nova Kool specializes in manufacturing innovative built-in, DC and AC/DC refrigeration products for mobile and off grid applications. They have been building quality products in the Pacific Northwest for over 20 years.

Features: for all models

- Positive latch system
- Storage for tall bottles
- Powder coated wire shelves for durability
- Brushed stainless steel door panel
- Environmentally sound 134a refrigerant
- CFC free urethane foam in cabinet and doors
- Magnetic door gaskets for positive seal
- Stainless fasteners & hinges used throughout
- Maintenance friendly & efficient static condenser
- Low battery protection to help prevent full discharge of batteries
- Backed with Nova Kools' Easy 2 year Warranty Program on all components

Single door units are available in either a refrigerator or a freezer. They can be ordered with either a left or right door swing. The sample shown is hinged right.



5.8 cu.ft.

R5810DC
F5810DC
Price: \$1445.00



Two Door Side-by-Side
RFS7501DC 7.5 cu.ft.
Price: \$1965.00

Nova Kool, the economical and efficient choice for DC powered refrigeration.

To view their full catalogue, go to www.novakool.com
If you find what you are looking for, give us a call and we will order it for you.

For the do-it-yourselfers, Nova Kool has a full line of conversion units available.
Call for info and prices.

Definition of Terms

Ah: amp hour

Amps: a unit of electrical current or volume

Dynamic Head: the "net" head under actual working conditions. This # is always less than static head and is a result of friction losses in the penstock.

Flow: the quantity of water flowing through the nozzles in the hydro. Leaks don't count. Most residential sized systems are measured in gallons per minute (GPM). Larger systems are measured in CFS (cubic feet per second). 450 GPM. = 1 CFS

Head: the vertical component or elevation change between the intake and the hydro-generator measured in feet or pounds per square inch (PSI) of pressure at the nozzle in the hydro. For those of you on the metric system, you will have to make your own conversions. 1 PSI = 2.31 feet of head. 1 foot of head = .433 PSI

kW: kilowatt, one thousand watts

kWh & Ah: By convention: amps, volts, and watts are instantaneous measurements of electrical energy. Over time, we commonly use: watt hours, kilowatt hours, and amp hours. One kilowatt-hour (kWh) equals the amount of electricity needed to burn a 100 watt light bulb for 10 hours. Amp hours is easier to understand and keep track of. For example, if your hydro is producing 5 amps for 24 hours, you have added (5 X 24) amp hours into your systems batteries which can be used or stored for later.

MPPT: maximum power point tracking

Ohms: a unit of electrical impedance. Ohms law states that 12 volts through 4 ohms impedance will allow 3 amps of current to flow. It is necessary to understand voltage drop in a run of wire and Ohms law is fundamental.

Penstock: a pipe or conduit used to carry water to a water wheel or turbine

PV: photovoltaic

Photovoltaic Module: solar panel

RE Source: renewable energy source

Solar Array: a group of solar panels

Static Head: Head measurement at 0 flow rate

Volts: a unit of electrical force, Volts = Amps x Ohms

Watts: a unit of power and is a product of amps x volts, for example: 4 amps at 12 volts = 48 watts. **Power (watts) = amps x volts**

What Are Your Needs

Please note what products you already have (water pump, generator etc.), if you are going to be running heavier power loads, what your average length of stay is, and your future plans for power requirements. This information is necessary when designing your system. A layout of your property is helpful !

About Us

Our Design Philosophy

We are a technically orientated company. All of our systems are thought out and designed based on the specifications of each product and its compatibility with all components used.

Our systems are designed to give the consumer an energy source that will provide years of reliability with little to no maintenance.

Most of the systems in this catalogue can be installed by the customer. Although this will depend on their skill level and complexity of the system and if they feel comfortable doing so. Installation can be arranged.

With so many choices available, we take the time to discuss your needs so you can make the best informed decision.
You will get the system that is right for you.

Our systems work!



Authorized Switch Energy Dealer: