

# **IPS** Integrated Power Systems

Back-up and Solar Power Systems

## Home, Cabin and Lodge Power Systems

2015 Catalogue



**IPS Integrated Power Systems Inc.**

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## **We offer design, engineering and installation.**

We are a technically orientated company. All our systems are 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.

If you need assistance please contact us at

**1-866-607-7640**

**sales@ipwr.net      www.ipwr.net**



# Why We Are Different

At Integrated Power Systems, 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 5 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 or wants to know regarding the day to day operation of the system ("amp-hours used", "battery percent full", etc.) Look for the BMK, TriMetric and PentaMetric in our catalogue on pages 11 & 12.

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 14 & 15 called "Let's 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 know inverters! We are a factory authorized warranty depot for Magnum Energy.** All our systems use pure sine wave inverters.

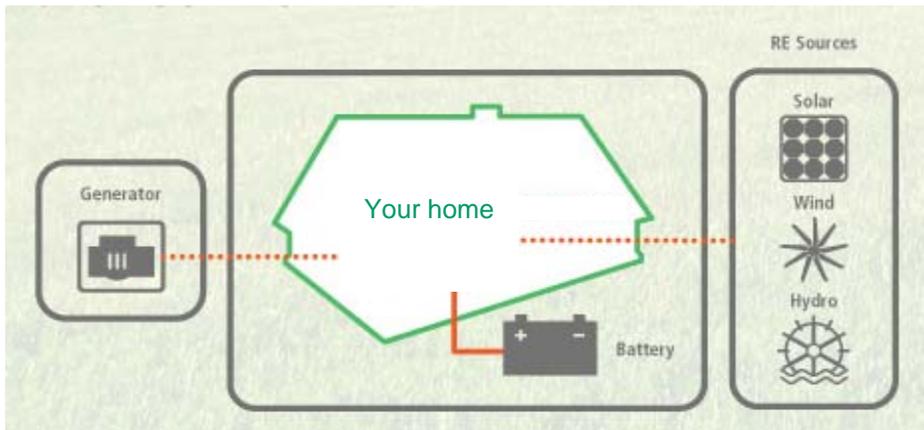
All our prices are landed cost to Kelowna, BC Canada. There are no extra charges such as brokerage, duty, etc. added (only the applicable taxes).

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

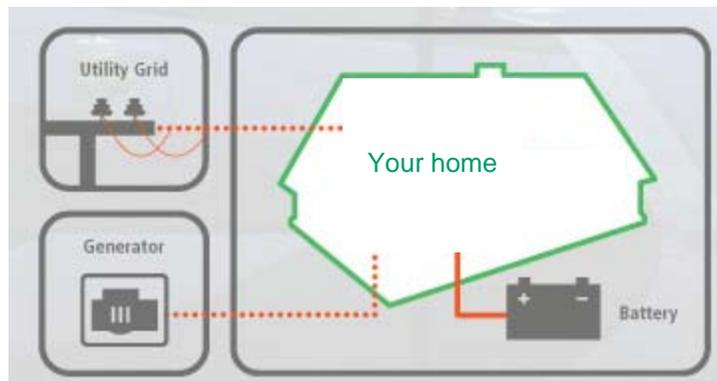
## Off Grid System



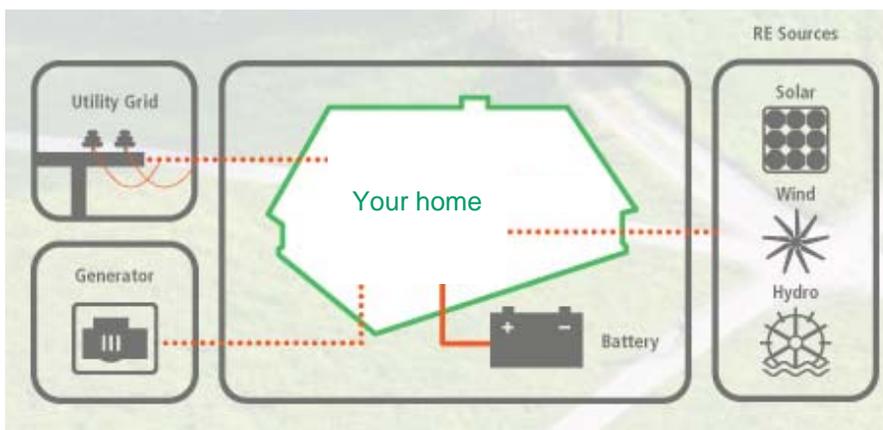
Our off grid systems will provide your home with a completely autonomous supply of electricity. Most systems use solar arrays, but a wind generator, micro-hydro generator, and/or a fuel generator can also be incorporated into our systems.

## 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.

# Batteries: AGM, Gel and Flooded

## 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. All our systems use either AGM or Gel batteries 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%.



**Battery Racks**

# Batteries: Lithium Ion

## Advanced Lithium Energy Storage

### Battery Storage

The need for better energy storage has led to the development of new battery chemistries which offer increased cycle life and energy transfer efficiency which are ideal for use in the renewable energy market. The SWE battery uses Lithium Iron Phosphate in combination with Yttrium Oxide to create a battery that delivers higher performance in both cold and hot environments.

**Energy Density** of the SWE battery is approximately 1/2 the size and 1/3 the weight of an equivalent lead acid battery.

**Discharge Rate** is a consideration in determining the battery capacity needed for energy storage.

For example: a system requiring a 100 Ah discharge during an eight hour period would require a 125 Ah SWE battery as compared to a 230 Ah lead acid battery. The combination of higher discharge rate and higher depth of discharge % (DOD) makes the SWE battery the ideal choice for both an off-grid or a grid-tie system with battery back-up.



Available in:

<b>SWE 18-24</b>	24 volt	18kW	700 Ah
<b>SWE 36-24</b>	24 volt	36kW	1400 Ah
<b>SWE 36-48</b>	48 volt	36kW	700 Ah

## HIGH CAPACITY LITHIUM BATTERIES

**3 Times the Energy Density**

**4 Times the Cycle Life**

of Lead Acid Batteries

**Cycle Life** is a measure of battery life expressed in terms of the number of charge and discharge cycles after which the battery becomes unusable. In lead acid batteries, most are not equipped with battery cell management, imbalance in lead acid cells leads to sulfation and battery death. The SWE battery is equipped with a sophisticated Battery Management System (BMS) that monitors and balances individual cells. The higher energy density of active material in lithium batteries provides over 4 times the cycle life of an equivalent lead acid battery.

**Transfer Efficiency** of energy produced from renewable energy sources to the batteries: The SWE battery has a 96% transfer efficiency compared to the lower 72 - 76% rate of the lead acid battery.

**Adding** a SWE-LBSU to a current solar installation or the replacement of an existing lead acid battery pack is as easy as connecting four cables to the internal power studs. Simple program changes to the solar charge controller and inverter, and the SWE-LBSU is installed and operational in minutes.

**The SWE Lithium Battery is an option that can be used in place of the lead acid batteries in some of our systems.**

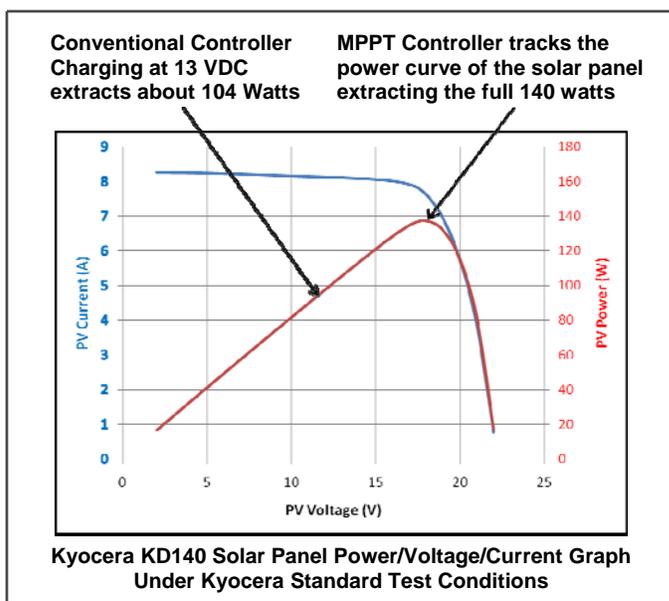
# What Is MPPT and Why We Use It

## 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 140 watt solar panel with a standard regulator, you will typically get between 100 to 110 watts depending on the battery voltage.

The same 140 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 140 watt panel and settle for only 100 watts of power from it? It just doesn't make sense! The increased wattage more than off sets the additional cost of the MPPT.**

# About Kyocera Solar Panels

## Kyocera High Efficiency Multi-Crystal Solar Panels The KD140 and KD255

### 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

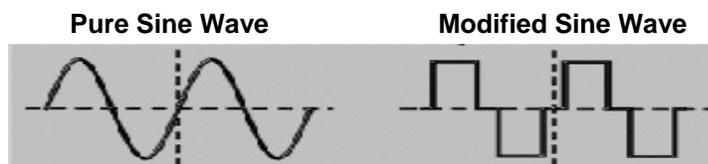
Kyocera has been building quality modules since 1975.  
Now manufactured in North America.  
cUL Listed

Solar Panel Spec's		KD140	KD255
Rated Power	watts	140	255
Current at Max. Power	amps	7.91	8.39
Voltage at Max. Power	volts	17.7	30.4
Short Circuit Current	amps	8.68	9.09
Open Circuit Voltage	volts	22.1	37.6
Maximum System Voltage	volts	600	600
Length	inches	59.1	65.4
Width	inches	26.3	39.0
Depth of Frame	inches	1.8	1.8
Weight	lbs	27.6	45
Warranty on Power Output	years	20	20

# Magnum Energy Inverter/Chargers

## About 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: modified and 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. 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.



## 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.



## Off Grid living with a 120/240 volt inverter/charger.

It has never been easier or more cost effective!



Web Based System  
Monitoring Now Available -  
See how your system is  
performing via the internet

To view our system at IPS, click on the following link:  
<http://data.magnumenergy.com/MW1242/>



## The MS-PAE Series Inverter/Charger

The MS-PAE 120/240V Series Inverter/Charger from Magnum Energy - A **pure sine wave** inverter designed specifically for the most demanding renewable energy applications. With this inverter you can run any 240 volt load, such as a well pump.

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

If more power is required, configurations of up to 4 inverter/chargers in parallel is possible.

# Magnum Energy Power Panels

**Our Products are Evaluated Under  
the CSA Special Inspection Program**

## ALL POWER PANELS INCLUDE:

- Magnum Inverter/Charger
- Magnum Mini Panel with AC/DC breakers
- MPPT Charge Controller
- Battery Monitoring Kit
- Remote Control or Advanced Remote Control
- Battery to Inverter Cables housed in Flexible Conduit
- Mounting Back Plate
- Easy Connection Points for Solar and AC Wiring
- CSA Evaluated as a Unit
- Built and Fully Tested by IPS

**Pre-assembled. Pre-wired. Fully-tested.  
Ready to be installed Power Panels.**



Single inverter system



Dual inverter system

**When installed on a  
Magnum Power Panel,  
the warranty on the  
Inverter & accessories\*  
increases to 5 years.**

**\*Applies to Magnum  
Energy products only\***



1000 watt  
inverter system

The Magnum Power Panels are quick and easy to install, and are electrical inspector friendly.

# Charge Controllers

A charge controller, or charge regulator is basically a voltage and/or current regulator to keep batteries from being overcharged. It regulates the voltage and current coming from the solar panels going to the battery. Most "12 volt" panels put out about 16 to 18 volts, so if there is no regulation the batteries will be damaged from overcharging.

Charge controllers come in all shapes, sizes, features, and price ranges. They range from small 4.5 amp controllers, up to 60 and 80 amp MPPT programmable controllers with computer interface.



TriStar MPPT

## Classic and TriStar Charge Controllers with MPPT Technology

Innovative MPPT technology ensures that your solar array is operating at its peak power regardless of age, shading or environmental conditions - increasing the performance by up to 30%.



Classic 200 MPPT

# OutBack Inverter

The new Radian Series Inverter/Charger is an integrated power appliance that does it all. The Radian Series Inverter/Charger introduces a radical new feature to the world of renewable energy: Simplicity. Nearly all of the components you need are combined in a single package. The Radian Series is unique in its ability to support large dynamic load variations without voltage spikes or sags.

From the sunniest day to the storm that knocks out the grid for a week - this system is built to carry the load.



## Radian 8048 Series Inverter

### Features:

- Pure sine wave output
- Grid-interactive and stand-alone capability in the same package
- 8000 watts of continuous power
- Unsurpassed surge capacity
- 120/240V split-phase power
- Dual AC inputs
- Field serviceable modular design
- GSLC load center option allows for quick and easy installation

# SMA Inverters

## Sunny Island 6048-US Inverter



### The Island Manager

The Sunny Island 6048 makes commissioning within minutes possible. All required operational settings can be made quickly and easily in just a few steps. The Sunny Island 6048 is versatile, extendable and takes on all control processes. Its first-class battery management ensures maximum battery life. It also features impressive efficiency, a rugged die-cast aluminum enclosure and the OptiCool active cooling system. The Sunny Island is also available in a UL-compliant 6048-US version with an output rating of 120 V and 60 Hz for the North American market.

Great for large power needs & commercial applications

#### Flexible

- For systems from 3 to 300 kW
- 1- and 3-phase operation, connectable in parallel and modularly extendable
- AC and DC coupling

#### Efficient

- High efficiency
- Intelligent battery management for maximum battery life
- Charge level calculation

#### Robust

- Extreme overload capability
- OptiCool™ active temperature management system
- 5-year warranty

One unique feature of the Sunny Island 6048 is it is a bidirectional inverter, which means the AC charging sources (solar, wind, micro-hydro or generator) can be coupled directly to the output of the inverter.

Pictured to the right is one of our installations. It is a 45 kW 3 phase SMA mini grid system comprised of both Sunny Island and Sunny Boy inverters.

We have extensive product knowledge and experience in designing, commissioning and testing these systems.



# 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



# Whole System Monitoring

## MagWeb from Magnum Energy

The MagWeb is a powerful and cost effective tool for remotely monitoring Magnum Energy's inverters and accessories. Installed on the Magnum network, the MagWeb provides live Internet monitoring of the inverter, battery monitor, and automatic generator start module. Using your always on Internet connection, the MagWeb makes live and historical conditions available to you through a web browser at [data.magnumenergy.com](http://data.magnumenergy.com).

### Data Samples

The MagWeb constantly streams data to your personal web pages, providing details on Current Conditions, Current Settings, and Daily Summaries for historical records.

To view our system at IPS, click on the following link:

<http://data.magnumenergy.com/MW1242/>



MagWeb Wireless Monitoring  
Price: \$515.78

MagWeb Ethernet Monitoring  
Price: \$389.03

# Water Pumps



## 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](#)



# Let's 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	TV	200
Computer (Desktop)	80-150	Satellite Internet	25	Satellite Dish	20
Well Pump (1/3-1 HP)	1200-3000			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.

# Let's 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	=		
		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. KD140	3920 watt hours/week
KD255	7140 watt hours/week
KD140 x 2	7840 watt hours/week
KD255 x 2	14280 watt hours/week

To find the watt hours a panel will provide, multiply the watts by approximately 4 hours of sunlight per day. The KD140 has 140 watts x 4 hours x 7 = 3920 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 23.

\* 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.

# Cabin Solar Kits

## Economy Weekend Cabin Kit #1 1000 watt inverter with 140 watt solar

- 1 Kyocera 140 watt solar panel with roof mounting kit
- 1 1000 watt pure sine wave inverter
- 1 30 amp charge controller
- 1 AGM battery - capacity: 1.2 kWh (100Ah@12V)

**CK9102 Price: \$2,056.75**

## Economy Weekend Cabin Kit #2 1000 watt inverter with 255 watt solar

- 1 Kyocera 255 watt solar panel with roof mounting kit
- 1 Regulator charge controller
- 1 Magnum 1000 watt inverter with remote
- 1 Battery monitor
- 2 AGM batteries - capacity: 2.4 kWh (200Ah@12V)

**CK9103 Price: \$4,810.03**



## Magnum Energy Systems 120VAC

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.

## Cabin Kit #1 2000 watt inverter with 510 watt solar array

- 2 Kyocera 255 watt solar panels
- 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 kit
- 1 Top of pole mount

**CK9104 Price: \$8,564.68**

## Cabin Kit #2 2800 watt inverter with 765 watt solar array

- 3 Kyocera 255 watt solar panels
- 1 MPPT regulator charge controller
- 1 Magnum 2800 watt inverter/charger with remote
- 2 AGM batteries - capacity: 4.6 kWh (390Ah@12V)
- 1 Battery monitor kit
- 1 Top of pole mount

**CK9105 Price: \$9,519.42**

## Cabin Kit #3 2800 watt inverter with 1020 watt solar array

- 4 Kyocera 255 watt solar panels
- 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 kit
- 1 Top of pole mount

**CK9106 Price: \$11,643.48**



### Please Note:

All the kits in this catalogue 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 Energy Systems 120VAC

The following systems are designed for homes with moderate power consumption. These systems come preassembled and ready to be installed. The MPPT Charge Controller and Battery Monitor are included in all our home kits. As with all renewable energy systems, conservation is the key.

### Small Home Kit #1 4000 watt inverter with 1530 watt solar array

6 Kyocera 255 watt solar panels  
 1 Magnum 4000 watt inverter/charger with remote 120VAC  
 4 AGM batteries - capacity: 9.3 kWh (390Ah@24V)  
 1 Top of pole mount  
**CK9107 Price: \$13,731.77**



### Small Home Kit #2 4000 watt inverter with 2040 watt solar array

8 Kyocera 255 watt solar panels  
 1 Magnum 4000 watt inverter/charger with remote 120VAC  
 8 AGM batteries - capacity: 18.7 kWh (780Ah@24V)  
 1 Top of pole mount  
**CK9108 Price: \$17,986.58**

## Magnum Energy Systems 120/240VAC

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.

### Small Home Kit #3 4000 watt inverter with 2040 watt solar array

8 Kyocera 255 watt solar panels  
 1 Magnum 4000 watt 120/240 volt inverter/charger with remote  
 8 AGM batteries - capacity: 18.7 kWh (780Ah@24V)  
 1 Top of pole mount  
**CK9109 Price: \$18,083.33**

### Small Home Kit #4 4400 watt inverter with 2040 watt solar array

8 Kyocera 255 watt solar panels  
 1 Magnum 4400 watt 120/240 volt inverter/charger with remote  
 8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)  
 1 Top of pole mount  
**CK9110 Price: \$18,044.93**

### Small Home Kit #5 4400 watt inverter with 3060 watt solar array

12 Kyocera 255 watt solar panels  
 1 Magnum 4400 watt 120/240 volt inverter/charger with remote  
 8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)  
 2 Top of pole mounts  
**CK91105 Price: \$21,346.21**



# Large Home Solar Kits

These are bigger systems designed for larger homes.

If you are not sure what your future power needs will be, the Large Home Kit #1 below is designed with expansion in mind. It can be expanded by adding another inverter and/or an additional solar array.

The MPPT Charge Controller and Battery Monitor are included in all our home kits.

## Expandable Large Home Kit #1 4400 watt inverter with 2040 watt solar array

The inverter in this system is mounted on a double back plate to allow for another inverter to be added.

8 Kyocera 255 watt solar panels

1 Magnum 4400 watt 120/240 volt inverter/charger with remote

8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)

1 Battery rack

1 Top of pole mount

**CK9111 Price: \$18,660.40**

### Inverter Expansion Kit for Above Home Kit #1

1 Magnum 4400 watt 120/240 volt inverter/charger

1 Magnum router

**CK9112 Price: \$3,500.73**

### Solar Expansion Kit for Above Home Kit #1

8 Kyocera 255 watt solar panels

1 Top of pole mount

**CK9113 Price: \$5,836.73**



## Large Home Kit #2 8800 watts with 3060 watt solar array

12 Kyocera 255 watt solar panels

2 Magnum 4400 watt 120/240 volt inverter/chargers with remote

16 AGM batteries - capacity: 37.4 kWh (780Ah@48V)

2 Battery racks

2 Top of pole mounts

**CK9114 Price: \$31,444.08**



## Large Home Kit #3 8800 watts with 4080 watt solar array

16 Kyocera 255 watt solar panels

2 Magnum 4400 watt 120/240 volt inverter/chargers with remote

24 AGM batteries - capacity: 57.6 kWh (1200Ah@48V)

2 Battery racks

2 Top of pole mounts

**CK9115 Price: \$40,536.17**

Please Note:

All the kits in this catalogue 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

The Magnum Energy stackable products that we use allows us to build systems of up to 17,600 watts 120/240VAC 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. The MPPT Charge Controller and Battery Monitor are included in all our home kits.

## Large Home Kit #4 13,200 watts with 6120 watt solar array

24 Kyocera 255 watt solar panels

3 Magnum 4400 watt 120/240 volt inverter/chargers with remote

24 AGM batteries - capacity: 57.6 kWh (1200Ah@48V)

2 Battery racks

3 Top of pole mounts

**CK9116 Price: \$52,670.75**

\*\*\*This system is expandable to 4 inverters using the Expansion Kit on page 17\*\*\*

## Large Home Kit #5 17,600 watts with 8160 watt solar array

32 Kyocera 255 watt solar panels

4 Magnum 4400 watt 120/240 volt inverter/chargers with remote

24 AGM batteries - capacity: 57.6 kWh (1200Ah@48V)

2 Battery racks

4 Top of pole mounts

**CK9117 Price: \$61,612.46**

## Resort #1 17,600 watts with 16,320 watt solar array

64 Kyocera 255 watt solar panels

4 Magnum 4400 watt 120/240 volt inverter/chargers with remote

48 AGM batteries - capacity: 115.2 kWh (2400Ah@48V)

4 Battery racks

8 Top of pole mounts

**CK91175 Price: \$102,087.60**



Quad inverter system

At **Integrated Power Systems**, 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.



## Grid-Tie Ready Solar Kit

This system is designed to be connected to the utility grid and has the added benefit of a battery bank which will provide you with power when the utility grid goes down.

### Grid-Tie with Battery Back-up 4000 watts with 4500 watt solar array

18 Trina 250 watt solar panels  
 Flush mount roof racking  
 1 Outback 4000 watt inverter/charger  
 1 Outback system controller  
 1 MPPT regulator charge controller  
 8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)  
**GT9100 Price: Call**



If you are already connected to the utility grid and are interested in a Grid-Tie System, be sure to ask for a copy of our 2015 Grid-Tie Catalogue. Systems available with or without battery back-up.

## 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 when 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 one in the picture? This is called "flagging" and it is caused by the tree being continually bombarded by wind as it grew. If your trees are like this, then you should have enough wind to make a turbine viable.



If you are not sure, we do have wind data logging equipment available to rent. Call for more info.

# Water Turbines

## 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.

### Mini Hydro Kit #1 2000 watt inverter with 400 watt water turbine

- 1 Water turbine
  - 1 Spring box
  - 1 Regulator charge controller
  - 1 Magnum 2000 watt inverter/charger with remote
  - 2 AGM batteries - capacity: 2.4 kWh (200Ah@12V)
  - 1 Battery monitor kit
  - 1 Dump load
- CK9118 Price: \$9,428.98**



Keep in mind that **a water turbine will produce power 24 hours a day.**

# 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: Let's 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 400 watt water turbine

- 1 Water turbine
  - 1 Spring box
  - 1 Regulator charge controller
  - 1 Magnum 2800 watt inverter/charger with remote
  - 2 AGM batteries - capacity: 2.4 kWh (200Ah@12V)
  - 1 Battery monitor kit
  - 1 Dump load
- CK9119 Price: \$9,710.75**



### Small Hydro Kit #2 4000 watt inverter with 1400 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 kit
  - 2 Dump loads
- CK9120 Price: \$13,580.94**



Intake box with hydro screen

### Large Hydro Kit #1 8800 watt inverter with 1400 watt water turbine

- 1 Water turbine
  - 1 Spring box
  - 1 Manifold
  - 1 Regulator charge controller
  - 2 Magnum 4400 watt 120/240V inverters/chargers with remote
  - 8 AGM batteries - capacity: 18.7 kWh (390Ah@48V)
  - 1 Battery monitor kit
  - 1 Dump load
- CK9121 Price: \$19,618.11**

All hydro kits do not include the cost of the pipeline.

# 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.

## **Kohler Propane Generators**

Available in: **14 kW**

**20 kW**

**6 kW VSG 24/48VDC**

Start Battery Included

Call for pricing



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 Diesel Generators**



30 kW Mitsubishi Generator

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

Call for more info.



16 kW Mitsubishi Generator

# 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

# 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 !

# Purchasing Options

## Commercial and Agricultural Leasing

We offer leasing programs to qualified clients.

### **Why Lease?**

Leasing will free up your business capital as well as give you the ability to regain your investment back in a shorter term through tax deductions.

### **Example of \$10.00 buy out at end of term purchase option lease:**

System Cost	<b>\$16,543.33</b>
Term	36 months
Payment	<b>\$590.92</b> Per month (+ tax)

### **We have leasing plans available from 24 to 66 months**

We also have a seasonal business plan available in which your payments are set for the 6 to 8 months you are in operation.

**Call for more info  
1-866-607-7640**

# 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!



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