Inverters

The inverter is a basic component of PV systems and it converts DC power from the batteries or in the case of grid-tie, directly from the PV array into high voltage AC power as needed. Inverters of the past were inefficient and unreliable while today's generation of inverters are very efficient (85 to 94%) and reliable.

Today, the majority, if not all of the loads in a typical remote home operate at 120 VAC from the inverter. Most stand-alone inverters produce only 120 VAC, not 120/240 VAC as in the typical utility-connected home. The reason being, once electrical heating appliances are replaced with gas appliances, there is little need for 240 VAC power. Exceptions include good-sized submersible pumps and shop tools which can either be powered by a generator, step-up transformer, or possibly justify the cost of adding a second inverter. Several utility line-tie inverters do produce 240 VAC.

Two types of stand-alone inverters predominate the market – modified sine and sine wave inverters. Modified sine wave units are less expensive per watt of power and do a good job of operating all but the most delicate appliances. Sine wave units produce power which is almost identical to the utility grid, will operate any appliance within their power range, and cost more per watt of output.

Utility-tie systems / sine wave inverters for utility interactive photovoltaic applications, provide direct conversion of solar electric energy to utility power with or without a battery storage system. These systems are designed to meet or exceed utility power company requirements and can be paralleled for any power level requirement. They are listed to UL 1741 for photovoltaic power systems.

Inverter Component Checklist

While an inverter can account for a good portion of the cost of a PV system, it is really a sub-system that requires a number of additional components. To make a safe, reliable, code compliant installation one should provide the following:

Inverter to battery cabling

Because of the high current required on low voltage circuits, this cable is large, commonly #2 to 4/0 in size. Smaller conductors than required are unsafe and will not allow the inverter to perform to its full rating.

DC input disconnect and overcurrent protection

It is important to have safe installation with a properly sized DC rated, UL listed disconnect. Typically the disconnect works in conjunction with an overcurrent protection device such as a fuse or circuit breaker. These components are usually installed in an enclosure which can also house shunts and additional equipment or circuit breakers.

Shunts

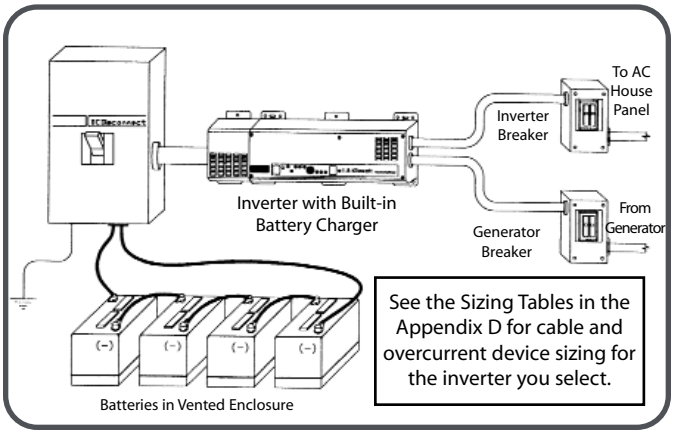
Used to read the amperage flowing between the battery and inverter, this device is installed in the negative conductor. It can easily be housed in the disconnect or its own enclosure.

AC output disconnect and overcurrent protection

If the breaker panel, which is fed from the inverter, is adjacent to the inverter, then the main breaker will serve as the inverter output disconnect and overcurrent protection. If, however, this panel is not grouped with the inverter, then a separate unit should be installed. This also holds true for AC circuits coming into the inverter from a generator or utility source. A second breaker may be needed if these breakers are not grouped.

Inverter Sub-System Checklist

_____ Inverter to battery cabling
_____ DC disconnect and overcurrent device
_____ Inverter conduit boxes
_____ Inverter output breaker box
_____ Generator input breaker box
_____ Shunt(s) if required for monitoring



See the Sizing Tables in the Appendix D for cable and overcurrent device sizing for the inverter you select.

Built-In Battery Chargers

Most larger inverters can operate as battery chargers as well. This is easily and economically accomplished because of the design of most inverters. Inverters step up low voltage DC power and change it to 120VAC power. Battery chargers do the reverse of this.

Transfer switches are also incorporated into these Inverter / Chargers so that the AC loads can be powered directly from the generator when the battery charger is operating.

From a reliability, performance, and economical standpoint, built-in battery chargers are the way to go.

Multi-Stage Battery Charging

A typical 12-volt lead-acid battery must be taken to approximately 14.2-14.6 VDC before it is fully charged. (For 24 volt systems double these figures for 48 volt, multiply by four.) If taken to a lesser voltage level, some of the sulfate deposits that form during discharge will remain on the battery's lead plates. Over time, these deposits will cause a 200 amp-hour battery to act more like a 100 amp-hour battery, and battery life will be shortened considerably. Once fully charged, batteries should be held at a lower float voltage to maintain their charge – typically 13.2 to 13.4 volts. Higher voltage levels will "gas" the battery and boil off electrolyte, requiring more frequent maintenance.

Most automotive battery charger designs cannot deal with the conflicting voltage requirements of the initial "bulk charge" and subsequent "float" or maintenance stage. These designs can accommodate only one charge voltage, and therefore must use a compromise setting – typically 13.8 volts. The result is a slow incomplete charge, sulfate deposit build-up, excessive gassing and reduced battery life.

The charger available in our inverters automatically cycles batteries through a proper three stage sequence (bulk, absorption and float) to assure a rapid and complete charge without excessive gassing.

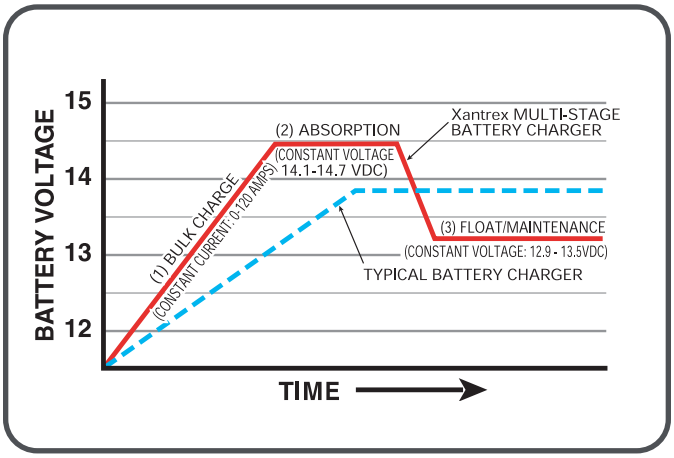
Factory battery charger settings on most inverter-charger combinations are optimal for a lead acid (liquid electrolyte) battery bank of 250-300 amp hours in a 70°F environment. If your installation varies from these conditions, you will obtain better performance from your batteries if you adjust the control settings.

The Maximum Charge Rate in amps should be set to 20-25% of the total amp-hour rating of a liquid electrolyte battery bank. For example, a 400 amp-hour bank should be charged at no more than an 80 -100 amp rate. Excessive charge rates can damage batteries and create a safety hazard.

Comparing Inverters

Inverters are compared by three factors:

- Continuous wattage rating. Hour after hour, what amount of power in watts can the inverter deliver.
- Surge Power. How much power and for how long can an inverter deliver the power needed to start motors and other loads.
- Efficiency. How efficient is the inverter at low, medium and high power draws. How much power is used at idle.



The Bulk Charge Voltage of typical liquid electrolyte lead acid batteries should be about 14.6 VDC. There is no one correct voltage for all types of batteries. Incorrect voltages will limit battery performance and useful life. Check the battery manufacturer's recommendations.

The Float Voltage setting should hold the batteries at a level high enough to maintain a full charge, but not so high as to cause excessive "gassing" which will "boil off" electrolyte. For a 12-volt liquid electrolyte battery at rest, a float voltage of 13.2-13.4 is normally appropriate; gel cells are typically maintained between 13.5 and 13.8. If the batteries are being used while in the float stage, slightly higher settings may be required.

Charge voltage guidelines used here are based on ambient temperatures of 70°F. If your batteries are not in a 70°F environment, the guidelines are not valid. Temperature Compensation automatically adjusts the voltage settings to compensate for the differences between ambient temperature and the 70°F baseline. Temperature compensation is important for all battery types, but particularly gel cell, valve-regulated types which are more sensitive to temperature.

xantrex STXR 2500 Utility Interactive Inverter

The STXR 2500 is designed, built and priced to make the benefits of site generated power easy and affordable. Now anyone can install a solar array on their home or business to reduce or eliminate their monthly electric bill while doing their part to reduce air pollution. To take full advantage of this type of a system, net metering from your utility company would be a big plus as it allows you to turn your existing kilowatt-hour meter backwards when your PV system is producing more power than you are using.

The STXR 2500 incorporates all of the NEC and IEEE required AC and DC input/output connections, disconnects and circuit breakers. A six input combiner and a ground fault protection device are included for installer convenience. With the optional rain shield (STRS) an STXR inverter can even be mounted on an outside wall near your utility service entrance.

Product Name	STXR2500
Part Number	**52931**
Price	**$2759.00**
AC Voltage - Nominal	240 VAC
DC Input Voltage - Nominal	48 VDC
Minimum Operational DC Input	44 VDC
Minimum Wake-up DC Input Voltage	70 VDC
AC Voltage - Min/Max	211-264 VAC (North American models)
Maximum Power Point Tracking	52-85 VDC (For full rated AC output power)
Absolute Max PV Open Circuit Voltage	120VDC
AC Output Characteristics	Current source
Frequency - Nominal	60Hz +0.5 – 0.7 per IEEE 929 and UL 1741
Continuous AC Output @ 40°C	2.5kVA
Efficiency @75% load - Peak	90% (91%)
AC Output Waveform	Sine wave, high frequency PWM controlled
Total Harmonic Distortion	Less than 5% at rated power per IEEE 929 and UL 1741
AC Disconnect	Double pole 15 Amp 240 VAC rated circuit breaker
DC Disconnect	Single pole 100 Amp DC rated circuit breaker
Specified Temperature Range	-38°F - 113°F (-39°C - +45°C)
User Display	Backlit alphanumeric dynamic LCD display - AC watts, kWh today, array voltage, and lifetime status messages.
Enclosure Type	Powder coated aluminum enclosure, fully screened
Combiner Board Included	Yes
Dimensions - Inverter Only (W x H x D)	13.25 x 33.25 x 5.3 (33.8 cm x 83.1 cm x 13.25 cm)
Weight - Inverter Only (lbs.)	35.0 (16 kg)
Shipping Weight (lbs.)	40.0 (18.14 kg)

STXR 2500

The STXR's proprietary Sunsweep™ Maximum Power Point Tracking (MPPT) technology maximizes power extraction from a PV array of any type (single crystal, poly-crystalline or amorphous) by matching the inverter's performance to current solar conditions. The STXR 2500 comes with a built-in backlit LCD display that shows system status and cumulative energy production. The optional remote meter (STRM) allows you to monitor the inverter's status and performance from 50 feet away.

The STXR 2500 requires a 48V nominal DC input from your solar array which is typically 4 solar modules wired in series. Multiple STXR inverters can be used in parallel for a solar array that is larger than 2500 watts. The STXR 2500 is listed to UL 1741, and cUL listed to CSA C22.2 No. 107.1-95. Its durable construction ensures a long life under any environmental conditions. Two year warranty.

Sun Tie (STXR) Inverter Accessories

Product Name and Description	Part Number	Price
SunTie Remote Monitor (STRM) with 50' of cable	52929	$179.00
SunTie Rain Shield (STRS)	52927	$125.00

xantrex Sine wave (SW) Inverters

This inverter/charger can be configured as a simple stand-alone unit, work in conjunction with your generator to handle loads too large for the generator alone, or function as a utility interactive inverter, with the use of the GTI option, sending excess power back into the power grid.

More Features

- Adjustable search mode can reduce idle power to 1 watt
- Current compensated, adjustable low battery cut-out volt ages and high battery cut-out protection.
- Protection circuitry guards against over-current, short circuit, over temp, low battery and high battery conditions.
- Battery charger design allows the use of smaller back up generators at high efficiencies.
- Three stage, temp. compensated, adjustable, battery charger, with remote temperature probe to maximize battery life.

SW4024 Inverter

The Grid Tie Interface (GTI) is an integrated assembly used with the Xantrex SW Series II Inverter / Charger with Revision 4.2 software. This new device provides active anti-islanding detection along with side benefits such as reducing voltage and current total harmonic distortion (THD) below the test requirements. Anti-islanding and THD testing is described in the IEEE-929-2000 and UL-1741-2000.

The SW units are certified to meet UL spec. 1741, and includes a powerful battery charger, a 60 amp AC transfer switch, automatic generator start function and three built-in programmable auxiliary relays for operating loads and/or charging sources. Two year warranty.

Model	SW4024	SW4048	SW5548	SW3024E	SW4548E
Part Number	**50187**	**50188**	**50189**	**50901**	**50932**
Price	**$3495.00**	**$3495.00**	**$3995.00**	**$3495.00**	**$3995.00**
Input Voltage	24VDC	48VDC	48VDC	24VDC	48VDC
Output Power (Watts)	4000	4000	5500	3300	4500
Continuous (Amps)	33	33	46	14	20
Surge Power (Amps)	78	78	78	34	34
Efficiency - Peak	94%	95%	96%	94%	96%
Output Voltage / Regulation	120 VAC/ +/- 2%			230 VAC/ +/- 2%	
Frequency / Regulation	60Hz/ +/- 0.04%			50Hz/ +/- 0.04%	
Input Requirements					
- Min. Search Power	1 watt				
- On Mode (No Load-Idle) (Amps)	16.0	16.0	20.0	16.0	20.0
- Input Voltage (VDC)	20.0 to 34.0	40.0 to 60.0	40.0 to 68.0	22.0 to 33.0	44.0 to 66.0
Distortion	3 to 5%				
Power Factor Allowed	-1 to 1				
Max. Charge Rate (Amps)	120.0	60.0	75.0	100.0	60.0
Automatic Transfer Relay (Amps)	60.0				
Specified Temperature Range	32°F - 113°F (0°C - 45°C)				
Series Operation with 2nd Unit	Yes, 240VAC				
Automatic Low Battery Protection	Adjustable				
Forced Air Cooling (4 speed fan)	Thermally Activated				
Temp. Comp. Probe	Yes				
Weight - Inverter Only (lbs.)	35.0 (16 kg)				
Shipping Weight (lbs.)	118.0	118.0	148.0	118.30	143.0

Inverter/Generator Backup Mode

The SW Series II includes a powerful battery charger and a 60 amp AC transfer switch. When utilizing the charging circuitry, we typically program the unit to activate the battery charger, and switch all AC loads to generator power via a pre-programmed low voltage set-point.

Extensive automatic generator start features are standard and user programmable. Gen start can be triggered by battery voltage, load size in amps or time of day. "Quiet time" can be set during which the generator is not allowed to start unless a "must start" override voltage is reached. "Warm-up seconds," max cranking seconds," and "max charge amps and/or gen amps AC" are some of the user adjustable parameters.

Grid Tie Interface (GTI)

Model	GTI
Part Number	**50345**
Price	**$449.00**
Utility Interactive Protection	Over/under AC voltage and frequency detection plus active islanding detection
AC Voltage (Nominal)	120 VAC
Frequency - Utility Interactive Mode	59.3 - 60.5Hz
Frequency - Bypass Mode	53.0 - 67.0Hz
AC Current (@25ºC) - Utility Interactive Mode	40A Continuous
AC Current (@25ºC) - Bypass Mode	60A Continuous
Total Output Harmonic Distortion (Typical)	2.5% at full power
Enclosure Type	Indoor, ventilated, steel chassis with white, powder coat finish
Dimensions (in.) (D x W x H)	6.3 x 21.0 x 7.0
Shipping Weight (lbs.)	26.0

xantrex Sine wave (SW) Plus Inverter Charger

The 2.5 kW Xantrex Sinewave Plus Inverter Charger with Smart Power Management (SW Plus) takes electrical independence to a new level. It can be programmed to operate in stand-alone, generator-hybrid, utility management, or backup power modes. The SW Plus has storable program settings (flash memory), simple three-level menus and plug-and-play expandability, which makes it easier than ever before to install and configure an independent power system. 2 year warranty.

SW Plus

More Features

- Powerful Surge (inrush current) up to 4 times continuous rating
- Non-volatile memory-user stored settings
- Includes standard built-in programming and operational status interface
- Excellent high temperature capabilities - full power at 40ºC
- Powerful, automatic 4-stage battery charger
- Programmable to take advantage of time of day utility rates

Options

- Expandable - Two SW Plus Inverters may be stacked for increased output in 120/240A configuration (5kW total)
- Matching AC and DC conduit boxes for code compliant installation
- Generator Start Module used to control two and three wire generators
- Auxiliary Load Module used to automatically start and stop auxiliary loads such as fans based on programmable voltage parameters.
- Inverter Communications Adapter allows for remote connection to Sine wave Plus via PC
- An Additional Inverter Control Module may be installed for remote operation and monitoring of an inverter

Model	SW Plus 2524	SW Plus 2548	SW Plus 4024	SW Plus 4048	SW Plus 5548
Part Number	**50935**	**50936**	**50960**	**50961**	**50962**
Price	**$2299.00***	**$2299.00***	**$2800.00**	**$2800.00**	**$3500.00**
AC Output Voltage	120 VAC				
Output Power - Continuous (Watts)	2500	2500	4000	4000	5000
Efficiency - Peak	95%	95%	95%	95 %	96%
Voltage Regulation	+/- 3%				
Frequency / Regulation	60 Hz / +/- 0.04 %				
Automatic Transfer Relay	60 A				
DC Input Voltage Range	22 to 32 VDC	44 to 64 VDC	22 to 32 VDC	44 to 64 VDC	44 to 64 VDC
DC Current @ Rated Power	120 A	60 A	190 A	95 A	135 A
Continuous Charge Rate	70 A	40 A	120 A	60 A	70 A
Dimensions (in.) (D x W x H)	15 x 21 x 9				
Shipping Weight (lbs.)	111.0				

SW Series Inverter Options

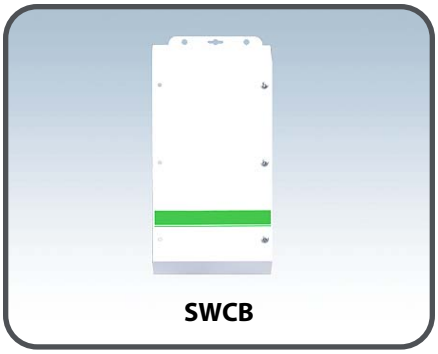
Product Name and Description	Part Number	Shipping Weight (lbs.)	Price
SWRC - Remote control monitor Duplicate of built-in unit on SW, 25' of cable	53036	3.0	$295.00
SWRC/50 Duplicate of built-in unit on SW, 50' of cable	53042	5.0	$329.00
SWI Series stacking interface cable between two identical SW or SW+ units for 120/240VAC operation. (not for use on export models).	50930	1.0	$45.00
SWI/PAR - Sine wave parallel kit Paralleling kit, connects two identical SW inverters together for twice the power output at the same voltage	50933	43.0	$345.00
SWI/PAR/E - Sine wave parallel kit for export models	50934	43.0	$345.00
SW-D - Display inverter (non-operational)	50480	28.0	$175.00
GSM Generator Start Module for SW+ inverters. Allows auto gen start (standard in SW Series)	53061	3.0	$159.00
ALM Auxiliary Load Module for SW+ inverters. Provides voltage controlled relays (standard in SW Series).	53062	3.0	$159.00
SWCA Sine wave Communications Adapter for SW. Allows PC connection and monitoring of up to 8 inverters , includes adapter, DOS based software 50' of cable and DB9 connector.	50943	9.0	$175.00

SWI

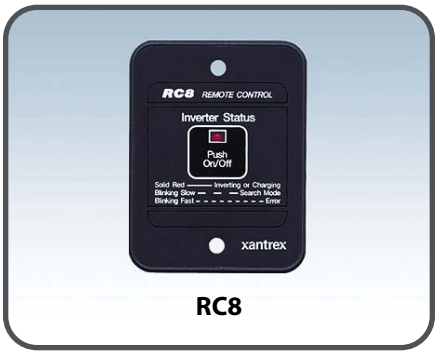
SWCA

SWRC

Product Name and Description	Part Number	Shipping Weight (lbs.)	Price
SWCB Sinewave Conduit Box. Fits on the DC or AC end of SW inverters.	50940	9.0	$94.00
RC8/100 Remote control panel. Designed for use with SW+, DR and UX inverter/chargers. Can be mounted up to 100' (30 meters) away for convenient status monitoring and on/off inverter activation.	50584	2.0	$94.00
RC8/50 Remote control panel. Designed for use with SW+, DR and UX inverter/chargers. Can be mounted up to 50' (15 meters) away for convenient status monitoring and on/off inverter activation.	50583	2.0	$69.00
ACCB - AC Conduit Box	50951	15.0	$369.00
DCCB - DC Conduit Box	50952	11.0	$94.00
ICM/25 - ICM Inverter Control Module with 25' cable	50965	10.0	$275.00
ICM/50 - ICM Inverter Control Module with 50' cable	50966	10.0	$295.00
ICA - ICA Inverter Communications Adapter	TBA	TBA	TBA
ISC-S Iverter Stacking Cable. Allows two idential SW+ inverters to provide 120/240V split phase	50970	1.0	$65.00
ISC-P Iverter Stacking Cable. Allows two idential SW+ inverters to provide 120/240V split phase	TBA	TBA	TBA



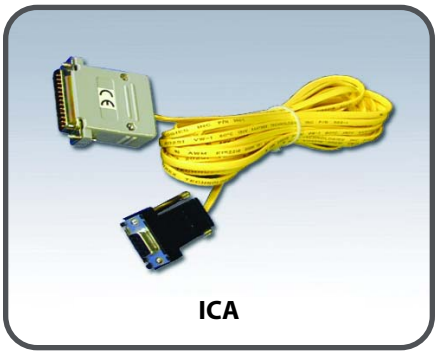
SWCB



RC8

ACCB

ICM



ICA

xantrex DR Series Modified Sine wave Inverters

The DR Series of inverter/chargers are extremely versatile. They are designed for remote home power, utility back-up systems, and industrial applications. An automatic battery charger and transfer switch are standard, as are the easy to understand status and control function LEDs.

Both the 12 and 24 volt input DR Series inverters utilize the same enclosure, only the input voltage, output wattage and weight vary.

DR Series Inverter

More Features

- 500 to 3600 watts of continuous power.
- Powder-coated, wall mounting chassis.
- Standard, built-in programmable battery charger.
- Series stackable for 240 VAC output.
- ETL certified to UL standards for residential use.
- Low power search mode.
- Automatic, fast transfer switching for standby.
- Overload and temperature protection power systems (SPS).
- Quiet, high-efficiency operation.
- Generator compatible.
- Two year warranty.

Product Name	DR512	DR524	DR1012	DR1024	DR1512	DR2412
Part Number	**51063**	**51064**	**51065**	**51066**	**51018**	**51012**
Price	**$360.00**	**$360.00**	**$475.00**	**$475.00**	**$1350.00**	**$1100.00**
Nominal Input Voltage (Volts)	12VDC	24VDC	12VDC	24VDC	12VDC	12VDC
Continuous Power (Watts)	500	500	1000	1000	1500	2400
Surge Power (Amps)	8.4		16.6		28.0	52.0
Efficiency - Peak	90%				94%	
Continuous Output (Amps AC)	4.2		8.3		12.5	20.0
Surge Capability (Amps)	8.4		16.6		27.0	55.0
Search Mode Consumption	< 1 watt					
DC Current @ Rated Power (Amps)	44.0	22.0	88.0	44.0	165.0	280.0
Input Voltage Range DC	10.8 - 15.5	21.6 - 31.0	10.8 - 15.5	21.6 - 31.0	10.8 - 15.5	
Output Voltage / Regulation	120VAC / +/- 5%					
Waveform	Modified sine wave					
Power Factor Allowed	-1 to +1					
Frequency	60Hz +/- 0.04%					
Adjustable Load Sensing	5 to 100W					
Series Stackable - 240VAC	Yes					
Low Battery Protection Cut-out	10.8VDC	21.6VDC	10.8VDC	21.6VDC	11VDC	
Forced Air Cooling	3 Speed Fan					
Automatic Transfer Relay	15A				30A	
Maximum Charger Rate (Adjustable)	0-20A	0-10A	0-35A	0-17.5A	0-70A	0-120A
Three Stage Charging	Yes					
Temp. Comp. Probe	Optional					
Operating Ambient Temp	0 to 50°C					
Dimensions (in.) (H x W x D)	5.5 x 6.5 x 16.25				8.5 x 7.25 x 21.0	
Shipping Weight (lbs.)	25.0	25.0	30.0	30.0	39.0	50.0

Product Name	DR1524	DR2424	DR3624	DR1512E	DR1524E	DR2424E
Part Number	**51015**	**51017**	**51018**	**51006**	**51016**	**51008**
Price	**$850.00**	**$1100.00**	**$1350.00**	**$850.00**	**$850.00**	**$1100.00**
Nominal Input Voltage (Volts)	24VDC	24VDC	24VDC	12.6VDC	25.2VDC	25.2VDC
Continuous Power (Watts)	1500	2400	3600	1500	1500	2400
Surge Power (Amps)	40.0	72.0	100.0	20.0	20.0	40.0
Efficiency - Peak	94%	95%	95%	94%	94%	95%
Continuous Output (Amps AC)	12.5	20.0	30.0	12.5	12.5	20.0
Surge Capability (Amps)	29.0	58.0	72.0	27.0	29.0	58.0
Search Mode Consumption	< 1 watt					
DC Current @ Rated Power (Amps)	80.0	140.0	210.0	150.0	37.0	120.0
Input Voltage Range DC	21.6 - 31.0			10.8 - 15.5	21.6 - 31.0	
Output Voltage / Regulation	120VAC / +/- 5%			230VAC / +/- 0.04%		
Waveform	Modified sine wave					
Power Factor Allowed	-1 to +1					
Frequency	60Hz +/- 0.04%			50Hz / +/- 0.04%		
Adjustable Load Sensing	5 to 100W					
Series Stackable - 240VAC	Yes					
Low Battery Protection Cut-out	22VDC			11VDC	22VDC	
Forced Air Cooling	3 Speed Fan					
Automatic Transfer Relay	30A					
Maximum Charger Rate (Adjustable)	0-35A	0-70A	0-70A	0-70A	0-35A	0-70A
Three Stage Charging	Yes					
Temp. Comp. Probe	Optional					
Operating Ambient Temp	0 to 50°C					
Dimensions (in.) (H x W x D)	8.5 x 7.25 x 21.0					
Shipping Weight (lbs.)	39.0	45.0	49.0	42.0	42.0	48.0

DR Series Inverter Options

Product Name and Description	Part Number	Shipping Weight (lbs.)	Price
DRI Stacking interface cable	51019	1.0	$85.00
BTS/15 Remote battery temp. sensor with 15 ft. cable	53037	1.0	$29.00
BTS/35 Same as above with 35 ft. cable	53063	2.0	$32.00
RC8/50 50' cable for DR, TS, UX inverters. Remote status monitor and on/off switch - specify voltage	50583	2.0	$69.00
RC8/100 100' cable. Remote status monitor and on/off switch	50584	3.0	$94.00
DRCB Conduit box - Can be used on the AC or DC side of inverter	53038	5.0	$69.00
DR-D Display DR Series inverter (Non-operational)	50482	16.0	$95.00

xantrex PV Series Inverters

PV Series Inverters are high voltage, commercial scale utility interactive, three-phase inverters, with models ranging from 5kW to 300kW. It is designed for cost-effectiveness, high performance, easy installation and reliability. Advanced MPPT technology for maximized PV array output (not for use with batteries). Revolutionary switching technology utilizing insulated gate bi-polar transistors (IGBT), greatly reducing power losses during the conversion process. The inverter meets all applicable UL, IEEE, and NEC codes. Automatic operation includes start-up, shut-down, self-diagnosis, and fault detection. Inverter models PV10, 15, and 20 include 5 year warranties as standard. Other units have a one year warranty with optional extension to five years.

PV Series Inverter

More Features

- Efficient design, with over 95% peak efficiency for the inverter, and overall efficiency, including transformer losses, in excess of 93%
- Digital Signal Processor (DSP) based controls with self-diagnostics and LDC for display of operating status.
- Inverter shut off and reset toggle switch.
- Over- and under-voltage and frequency protection, shutting down the inverter in compliance with UL1741.
- Anti-islanding protection - prevents back-feeding inverter-generated power to the grid in the event of a utility outage.
- User definable power tracking matches the inverter to the array, as well as adjustable delay periods to customize system shut-down sequences.

Model	PV10	PV15	PV20	PV30	PV45	PV100	PV225
Part Number	**52501**	**52502**	**52508**	**52509**	**52510**	**52507**	**52512**
Price	**$8473.00**	**$12200.00**	**$15452.00**	**$20989.00**	**$29647.00**	**$69241.00**	**$114697.00**
Nominal Output Voltage (Volts)	208VAC						
Continuous Power (Watts)	10000	15000	20000	30000	45000	10000	225000
Max. AC Line Current (Amps)	30.8	46.3	61.7	94	143	316	325
Line Power Factor	> 0.99 above 20% rated power						
Efficiency - Peak	95%	95%	95%	95%	95%	95%	95%
Max. DC Input Current (Amps)	30.8	47.8	63.8	100	150	319	710
Max. Open Circuit Voltage	600 VDC						
Power Tracking Window Range	330 to 480 VDC (360 Nominal)						
Frequency	60Hz (+0.5Hz / -0.7Hz)						
Ambient Temperature	-20 to 50ºC						
Storage Temperature	-40 to 50ºC						
Cooling Method	Forced Convection Cooling						
Shipping Weight (lbs.)	115.0	191.0	205.0	288.0	400.0	1000.0	2150.0

PV Series Inverter Options

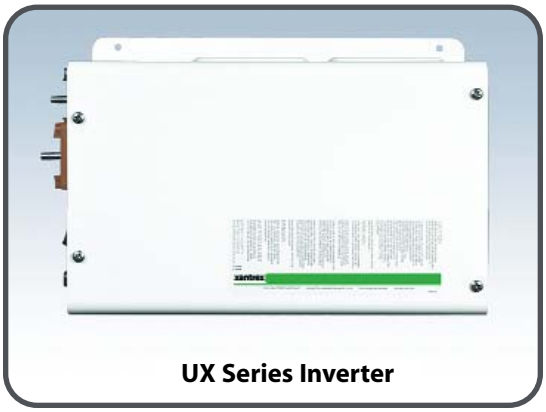
Product Name and Description	Part Number	Price	Shipping Weight (lbs.)
PV10208 208VAC Complete Kit	52505	$12257.80	362.0
PV10208 480VAC Complete Kit	52516	$12082.75	362.0
PV15208 208VAC Complete Kit	52517	$17396.18	562.0
PV15208 480VAC Complete Kit	52518	$17221.13	555.0
PV20208 208VAC Complete Kit	52519	$21138.25	660.0
PV20208 480VAC Complete Kit	52506	$20860.58	665.0
PV30208 208VAC Complete Kit	52511	$27775.22	675.0
PV30208 480VAC Complete Kit	52530	$27155.15	680.0
Combiner Box 10 Circuit, fuses not included, NEMA 3R	52543	$581.00	14.0
Combiner Box 12 Circuit, fuses not included, NEMA 3R, touch safe	52544	$756.00	20.0
Combiner Box 10 Circuit, 5 ADC, with diodes, fuses not included, NEMA 3R	52545	$723.00	20.0
Fuse, Midget, 600 VDC, 10A	52549	$15.70	1.0
Fuse, Midget, 600 VDC, 15A	52547	$15.70	1.0
Fuse, Midget, 600 VDC, 20A	52550	$15.70	1.0

Combiner Box 12

Complete kit includes: Inverter, Isolation Transformer, AC Disconnect Switch, DC Disconnect Switch, Combiner Box, 10 pole, 15 ADC 600 VDC Fuse

xantrex UX Series Inverters

The UX Series is a powerful, compact inverter for use with renewable energy systems in vacation cabins or small remote homes, and as a back-up power unit in homes and businesses. This modified sine wave unit is available in three standard sizes: 600 watts, 1100 watts, and 1400 watts. Each size is also offered with a three stage battery charger option (SB). Available in export voltages (E) models.



UX Series Inverter

More Features

- 500 to 1400 watts continuous output
- Surges 2500-3400 watts
- ETL certified to UL specifications
- Available in export voltages and frequencies (230VAC, 50Hz)
- Available with or without the (SB) battery charger and transfer switch

Model	UX512E	UX612	UX1112	UX1112E	UX1412
Part Number	**50564**	**50560**	**50570**	**50574**	**50580**
Price	**$595.00**	**$595.00**	**$795.00**	**$729.00**	**$885.00**
Continuous Power (Watts)	500	600	1100	1100	1400
Surge Power (Watts)	2500	2500	3000	3000	3400
Efficiency - Peak	92%	92%	90%	90%	92%
Input Current					
- Search Mode (Amps)	0.022A	.022A	.045A	.045A	.06A
- On Mode (No Load-Idle) (Amps)	0.4A	0.4A	0.45A	0.45A	0.6A
Nominal Input Voltage	12VDC				
Input Voltage Range	10.8 - 15.5VDC				
Nominal Output Range	230 VAC	120 VAC		230 VAC	120 VAC
Voltage Regulation	5% Max +/- 2.5% Typical				
Frequency	50Hz +/-0.04%	60Hz +/-0.04%		50Hz +/-0.04%	60Hz +/-0.04%
Waveform	Modified sine wave				
Power Factor Allowed	Power factor of load can very from -1 to +1				
Dimensions (in.) (H x W x D)	10.5 x 15.5 x 6.0				
Shipping Weight (lbs.)	30.0	30.0	30.0	40.0	41.0

Model	UX512ESB	UX612SB	UX1112SB	UX112ESB	UX1412SB
Part Number	**50566**	**50562**	**50572**	**50576**	**50582**
Price	**$695.00**	**$695.00**	**$895.00**	**$829.00**	**$985.00**
Automatic Transfer Relay	30 Amps AC				
Maximum Charge Rate	25 Amps DC	25Amps DC	50 Amps DC	50 Amps DC	50 Amps DC
Three Stage Charging	Yes				
Shipping Weight (lbs.)	30.0	30.0	36.0	36.0	41.0

UX Series Inverter Options

Product Name and Description	Part Number	Price
RC8-50 Remote Control Option	50583	$69.00
RC8/100 Remote Control Option	50584	$94.00
BTS/15 - Battery Temp. Sensor	53037	$29.00
BTS/35 - Battery Temp. Sensor	53063	$32.00
UX-D Display	50577	$70.00

xantrex

RV/Marine Inverters

SW Heavy Duty True Sine Wave Inverter/Chargers

Widely used in RV, marine, truck, and other mobile applications, the SW2512MC and SW4024MC2 instantly supplies true sine wave , utility grade, AC output power. Ideal for heavier loads, the SW2512MC and SW4024MC2 offer high capacity battery charging, high surge current ability (inrush current), and easy installation.

More Features

- Three-stage battery charging (bulk, absorption, and float) with remote temperature sensor for increased charge accuracy.
- Dual AC source inputs - shorepower and generator.
- Programmable control modules with LCD and LED indicators.
- Low idle current (less than 16 watts) conserves energy when no loads are present.
- Soft start capability for starting heavy loads.
- Series stacking capability for 120/240 VAC.
- Parallel stacking capability for greater output at the same volt age.
- Remote panel and status indicator (optional).
- Two year warranty.

SW2512MC

Model	SW2512MC	SW4024MC2
Part Number	**50945**	**50944**
Price	**$2585.00**	**$3345.00**
AC Input Voltage Range	50-149 VAC	
AC Input Current (AC pass thru)	60 A	
Continuous Power	2500 VA	4000 VA
Efficiency - Peak	90%	94%
AC Output Voltage (RMS) / Regulator	120 VAC / +/-5%	
Frequency	60 Hz	
Total Harmonic Distortion	< 5%	
Continuous Ouput	21 A	33 A
Surge Capacity (5 sec rating)	4000 Watts	8000 Watts
Automatic Transfer Relay	60 A	60 A
DC Input Voltage (Nominal)	12 VDC	24 VDC
DC Current at Rated Power	275 A	200 A
Idle Consumption	< 16 Watts	
Maximum Charge Rate (Adjustable)	150A @12VDC nominal	150A @24VDC nominal
Dimensions (in.) (H x W x D)	15 x 27 x 21	
Shipping Weight (lbs.)	96.0	111.0

Freedom 458 Series

With filtered modified sine wave output, Freedom 458 inverter/chargers run virtually anything, from office equipment to household appliances and electronics. Temperature controlled multi-stage charging ensures that your batteries are recharged quickly, and automatic shutdown and other safety features protect your expensive deep-cycle batteries from excessive depletion.

Freedom 458 10-12

More Features:

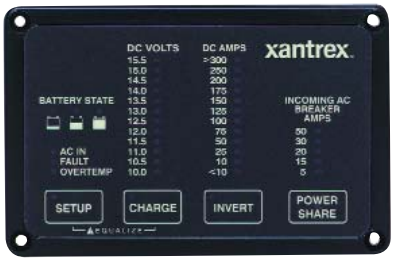
- 1000 to 3000 watt continuous output
- 50 to 140 amp automatic chargers
- Programmable front panel and LED indicators
- Three-stage battery charger recharges batteries quickly and accurately
- Temperature sensitive charging provides optimal care of all types of deep cycle batteries
- Built-in 30 amp transfer switch automatically transfers between inverter power and incoming AC power
- Power sharing prevents source AC input circuit breaker from tripping
- Customized settings can be programmed with the Freedom Basic Remote or Link 1000 panel
- Includes battery temperature sensor
- UL and cUL listed to 458 Standard
- 30 month warranty

Model	FDM 458 10-12	FDM 458 15-12	FDM 458 20-12	FDM 458 30-12	FDM 458 25-12 D/D*	FDM 458 30-12 D/D*
Part Number	**51690**	**51691**	**51692**	**51694**	**51695**	**51698**
Price	**$975.00**	**$1125.00**	**$1225.00**	**$1625.00**	**$1425.00**	**$1625.00**
Continuous Output Power	1000 W	1500 W	2000 W	3000 W	2500 W	3000 W
Surge Power (Amps)	25 A	37.5A	50 A	75 A	62.5 A	75 A
Output Frequency	60 Hz					
Output Voltage / Regulation	120 V +/-5%					
Efficiency - Peak	93%	92%	92 %	93%	92%	93%
Charge Rate	50 A	75 A	100 A	140 A	130A	140A
Battery Voltage (Nominal)	12 VDC					
AC Input (Max. Charge Mode)	20 A	17 A	21 A	28 A	26 A	28A
Dimensions (in.) (H x W x D)	7.9 x 11.5 x 13.2					
Shipping Weight (lbs.)	45.0	45.0	45.0	50.0	50.0	50.0

*D/D: dual input, dual output

FDM Series Options

Product Name and Description	Part Number	Price
Remote Control Panel FDM12-25	51548	$150.00
Remote Panel 12V Head Only	51550	$150.00
Cable Assembly Kit 50’	51551	$15.00



Remote Control Panel

xantrex Prosine Inverters

The 2.0, 2.5 and 3 kW inverters include the "smart" battery charging circuitry that is available in the True Charge battery chargers, as well as an automatic 30 amp transfer switch. The high frequency switching technology of these inverters eliminates the need for large, heavy transformers. This reduces the size and weight when compared to other units. The display panel and on/off switch can be mounted remotely so this inverter/ charger can be mounted anywhere, even inside a large, well-ventilated enclosure.

Xantrex is known for their high level of quality and excellent customer support. We believe this line of sinewave inverters will have a dramatic effect on the solar electric industry as they are the first to have this quality in a sinewave at these prices. One year warranty on 2.5 and 3kW, and two year warranty on 1.0, 1.8, and 2.0 kW. 30 foot cable included.

PROSine 1000 Inverter

Product Name	1000/12 GFCI	1000/12 AC Hardwire	1000/12 AC Hardwire & Transfer Switch	1000/24 GFCI	1000/24 AC Hardwire	1800/12 GFCI	1800/12 AC Hardwire & Transfer Switch
Part Number	**49986**	**49987**	**49988**	**49989**	**49994**	**49983**	**49985**
Price	**$890.00**	**$890.00**	**$940.00**	**$980.00**	**$980.00**	**$1300.00**	**$1350.00**
Continuous Output Power	1000 W					1800 W	
Surge Rating (5 seconds)	1500 W					2900 W	
Inverter Efficiency - Peak	89%					90%	
Search Mode Power Draw	<1.5W						
Wave Shape	Sine wave <3% THD						
Input Voltage Range	10-14 V			20-32 V		10-14 V	
Dimensions (in.) (L x W x H)	15.4 x 11.0 x 4.5						
Shipping Weight (lbs.)	17.0	17.0	17.0	17.0	17.0	18.0	18.0

Product Name	1800/24 GFCI	1800/24 AC Hardwire & Transfer Switch	2000/12 H/W & Transfer Switch	2000/12 GFCI, H/W & Transfer Switch	2500/12	2500/24	3000/12	3000/24
Part Number	**50003**	**49999**	**49996**	**49995**	**49982**	**49992**	**49981**	**49993**
Price	**$1430.00**	**$1480.00**	**$2000.00**	**$2000.00**	**$2600.00**	**$2860.00**	**$3000.00**	**$3300.00**
Continuous Output Power	1800 W		2000 W		2500 W	2500 W	3000 W	3000 W
Surge Rating (5 seconds)	2900 W		4500 W		4000 W	4000 W	4000 W	4000 W
Inverter Efficiency - Peak	90%		89%		88%	88%	88%	88%
Search Mode Power Draw	<2W							
Wave Shape	Sine wave <5% THD							
Input Voltage Range	20-32 V		10-16 V		10-16 V	20-32 V	10-16 V	20-32 V
Dimensions (in.) (L x W x H)	15.4 x 11.0 x 4.5				20.0 x 15.5 x 5.5			
Shipping Weight (lbs.)	18.0	18.0	24.0	24.0	32.0	32.0	32.0	32.0

PROSine Series Inverter Options

Product Name and Description	Part Number	Price
ACS - Advanced Control System Remote Panel for PROsine 2500 only.	49991	$250.00
Remote Panel Interface Kit for 1000/1800	49998	$50.00
Temperature Sensor	35932	$30.00
DC Conduit Box for PROsine 2000	50937	$89.00

xantrex Portawattz® Modified Sinewave Inverters

Imagine being able to run business and household items miles away from the nearest utility line. With the Portawattz line of inverters from Xantrex, a world of possibilities is open to you at an affordable price.

There are several Portawattz units available ranging from 150 to 2500 watt continuous output. The 150 and 300 watt units have a cigarette lighter style plug for the DC input and they are designed to power small loads like a television, VCR, stereo, lights and a desktop or laptop computer. These units are perfect for bringing along in the car, boat or RV since you can simply plug it into your cigarette lighter for quick and easy 120 VAC power.

Their larger units (600 to 3000 watt) are designed to be hard wired to the battery bank with appropriately sized conductors and fusing (Appendix D). These units are able to power larger loads like microwave ovens, refrigerators, vacuum cleaners and power tools. The 1000, 1750 and 3000 watt units have LED bar graphs indicating the battery voltage and load amperage which provides a measure of system status monitoring.

All of the Portawattz units will shut down if the battery voltage gets too low, if overheated or overloaded and will reset themselves automatically once the problem is corrected. All units specified here are 12 VDC nominal input with a 115 VAC 60 Hz output.

Portawattz 600

Portawattz 1000

Portawattz 3000

Inverter cables can be found on page 100 & 101.

More Features

- 90% efficient over power range
- High frequency switching design dramatically reduces transformer size and weight
- Front panel LED's report voltage and inverter current draw (1000, 1750 & 3000W units only)
- DC Input voltage range from 10 to 15 volts
- 1 year warranty

Model	Portawattz 150	Portawattz 300	Portawattz 400
Part Number	**49910**	**49912**	**49915**
Price	**$40.00**	**$50.00**	**$69.95**
Continuous Output Power	150 W	300 W	400 W
5 Minute Surge Power	200 W	500 W	800 W
No Load Current Draw	0.06 A	0.18 A	0.18 A
Output Voltage & Waveform	115 VAC RMS +/-5% Modified Sine wave		
Output Frequency	60Hz quartz crystal controlled		
Dimensions (in.) (L x W x H)	4.7 x 4.7 x 1.6	6.0 x 4.7 x 1.8	6.3 x 4.7 x 1.9
Shipping Weight (lbs.)	1.0	2.0	1.8

Model	Portawattz 600	Portawattz 700	Portawattz 1000	Portawattz 1750	Portawattz 3000
Part Number	**49913**	**49918**	**49914**	**49916**	**49917**
Price	**$110.00**	**$119.15**	**$270.00**	**$380.00**	**$600.00**
Continuous Output Power	600W	700W	800W	1500W	2500W
5 Minute Surge Power	1200W	1300W	2000W	3000W	5000W
No Load Current Draw	0.3A	0.3A	0.3A	0.6A	0.65A
Output Voltage & Waveform	115VAC RMS +/-5% Modified Sinewave				
Output Frequency	60Hz quartz crystal controlled				
Dimensions (in.) (L x W x H)	11.0 x 6.25 x 2.5	11.0 x 6.25 x 2.5	10.25 x 9.5 x 3.25	16.25 x 9.5 x 3.25	20.0 x 8.5 x 6.5
Shipping Weight (lbs.)	5.0	4.5	7.0	10.0	24.0

xantrex PROwatt® Inverters

Highest quality inverters are perfect for remote AC power needs, modified sine wave output for operating power tools, computers and small appliances from a 12V battery. These lightweight models are 100% solid state. Transformer-less design is rated 90% peak efficiency and features exceptionally low idle current power loss. Wattage ratings shown are continuous duty at 115VAC / 60Hz.

Product Name	Notepower 50	Notepower 75
Part Number	**49975**	**49977**
Price	**$39.00**	**$74.00**
Continuous Output Power	50 W	70 W
Surge Capacity	75 W	150 W
No Load Current Draw	< .07 A	< 0.15 A
Output Voltage / Waveform	115 VAC / Modified Sine wave	
Output Frequency	60Hz +/- 3Hz	
Dimensions (in.) (L x W x H)	3.5x2.5x1.25	4.8x3.2x1.6
Shipping Weight (lbs.)	1.5	2.0

PROwatt 3000

Product Name	PROwatt 150	PROwatt 300	PROwatt 600	PROwatt 1000	PROwatt 1750	PROwatt 3000
Part Number	**50030**	**50021**	**49911**	**49920**	**49921**	**50036**
Price	**$75.00**	**$60.00**	**$130.00**	**$488.00**	**$689.00**	**$800.00**
Continuous Output Power	150	300	600	1000	1750	2500
Surge Capacity	400 W	500 W	1200 W	2000 W	3000 W	5000 W
No Load Current Draw	0. 1A	0.18 A	0.3 A	< 0.45 A	< 0.5 A	< 0.6 A
Output Voltage / Waveform	115 VAC RMS / Modified Sine wave					
Output Frequency	60 +/- 4Hz			60 +/- 0.01 Hz		
Dimensions (in.) (L x W x H)	4.7 x 4.7 x 1.6	6.3 x 4.7 x 1.9	2.5 x 6.25 x 11	10.25 x 9.5 x 3.25	16.25 x 9.5 x 3.25	20.0 x 8.5 x 6.5
Shipping Weight (lbs.)	1.3	1.8	4.5	5.2	8.25	20

PROwatt Series Inverter Options

Product Name and Description	Part Number	Price
Remote Switch - for retrofit on PROwatt 1000, 1750 and 3000	50035	$25.00

xantrex

XPower Inverters

XPower Micro Inverters

The ideal mobile office companion from Xantrex, XPower Micro Inverter are the smallest power inverter on the market today. It incorporates high-frequency technology to convert power from a vehicle's battery (12-volt DC) into standard utility power (115-volt AC, 60 Hz). By plugging the XPower Micro Inverter into a vehicle's lighter socket, users can conveniently recharge and run electronic devices such as cell phones, camcorders, laptop computers, PDAs, televisions and computer games, without the need for multiple adaptors.

More Features

- Converts 12 VDC power from vehicle battery into 115 VAC power
- Two/Three-prong AC outlet to handle all chargers
- Compact and lightweight
- One year warranty
- Over-temperature shutdown
- Low battery voltage shutdown (10.5 VDC and automatic reset)
- High battery voltage shut down (15.5 VAC and automatic reset)
- Overload shutdown

XPower Micro Inverter 175

Model	175	200	400	800
Part Number	**35890**	**35891**	**35892**	**35893**
Price	**$44.99**	**$49.99**	**$69.99**	**$89.99**
Continuous Output Power	140 W	160 W	320 W	640 W
5 Minute Surge Power	175 W	200 W	400 W	750 W
No Load Current Draw	< 0.35 A	< 0.30 A	< 0.25 A	< 0.40 A
Output Voltage & Waveform	115 VAC RMS +/-5% Modified Sine wave			
Output Frequency	60 +/- 4Hz			
Dimensions (in.) (L x W x H)	1.9 x 2.9 x 4.8	4.1 x 3.3 x 2.0	5.4 x 4.0 x 2.0	7.5 x 4.5 x 2.4
Shipping Weight (lbs.)	0.38	0.6	1.0	1.14

XPower Mobile-Plug 75

The ideal office companion, XPower Mobile·Plug 75 (part#813-0075) is the smallest inverter on the market today. It incorporates high frequency technology to convert power from a vehicle's battery (12-volt DC) into standard utility power (120-volt AC, 60 Hz) through a single, three prong outlet. By plugging the XPower Mobile·Plug 75 into a vehicle's lighter socket, users can recharge and run electronic devices such as cell phones, camcorders, and most laptop computers and PDAs - without the need for multiple adaptors.

Model	75
Part Number	**35894**
Price	**$29.99**
Continuous Output Power	60 W
5 Minute Surge Power	75 W
No Load Current Draw	< 0.15 A
Output Voltage & Waveform	115 VAC RMS +/-5% Modified Sine wave
Output Frequency	60 +/- 4Hz
Dimensions (in.) (L x W x H)	1.7 x 2.5 x 4.8
Shipping Weight (lbs.)	0.31

XPower Mobile-Plug 75

XPower Inverters

The XPower Inverters are compact and lightweight inverter that easily connects to a 12 VDC battery and provide AC power. The XPower Inverters are ideal for long haul truckers who need to power home appliances, consumer electronic and office equipment on-board their truck. They are also suitable for small contractors to operate handheld power tools from their van or pick-up truck, and for use in an RV or minivan.

More Features

- Portable power for AC products
- Two AC receptacles for connecting multiple loads
- High surge capacity for products that require more power to start
- High efficiency - converts virtually all the battery's available power to AC
- Mounting brackets for convenient installation
- Heavy duty stud connectors
- Overload and over temperature shutdown
- Over voltage protection (15.0 VDC)
- Low voltage alarm (11.0 VDC)
- Low voltage cut-out (10.5 VDC)

XPower Inverter 1000

Model	1000	1200 Plus	1750 Plus
Part Number	**35899**	**35903**	**35904**
Price	**$109.99**	**$199.99**	**$299.99**
Continuous Output Power	1000 W	1000 W	1500 W
Surge Capacity	2000 W	2000 W	3000 W
No Load Current Draw	< 0.30 A	< 0.40 A	< 0.40 A
Output Voltage & Waveform	115 VAC RMS +/-5% Modified Sine wave		
Output Frequency	60 +/- 4Hz		
Optimum Efficiency	90%		
Dimensions (in.) (L x W x H)	2.75 x 5.94 x 11.34	3.2 x 9.4 x 11.4	3.2 x 9.4 x 17.3
Shipping Weight (lbs.)	4.23	6.8	9.4

XPower Handheld Inverters

By plugging an inverter directly into a 12-volt lighter socket, you can turn your vehicle into a mobile office or have power to run entertainment electronics like popular handheld games or TVs. Xantrex inverters automatically sense low battery voltage so you never have to worry about a depleted battery. Compact and lightweight, XPower in-vehicle power inverters are available in a variety of power levels.

Model	175 Plus	400 Plus	700 Plus
Part Number	**35898**	**35906**	**35907**
Price	**$29.99**	**$39.99**	**$69.99**
Continuous Output Power	150 W	320 W	560 W
5 Minute Surge Power	300 W	600 W	1000 W
No Load Current Draw	0.15 A	0.20 A	< 0.25 A
Output Voltage & Waveform	115 VAC RMS +/-5% Modified Sine wave		
Output Frequency	60 +/- 4Hz		
Output Frequency	90%		
Dimensions (in.) (L x W x H)	5.1 x 4.1 x 2.25	5.9 x 4.1 x 2.25	7.25 x 4.1 x 2.25
Shipping Weight (lbs.)	1.2	1.4	2.0

Samlex Pure Sine Wave Inverters

Pure Sine Wave Inverter

With a passively cooled heat sink, no fans to break down, minimal derating with an ambient temperature of up to 70 degrees Celsius and simple hook up, this unit will not let you down. The Samlex 150 Watt, Pure Sine Wave Inverter is an excellent performer providing high caliber, pure sine wave output simply and reliably. An excellent choice for powering small loads in consumer and industrial applications.

Now you have two more choices in pure sine wave inverters, at the price of some modified sine wave units. The PST-60S-12 is rated at 600 watts continuous. It can supply a surge to 1000 watts for a few seconds to start motor loads. The PST-100S-12 is rated at 1000 watts continuous. It can supply a surge to 1300 watts for 2 seconds to start motor loads. Both supply pure sine wave output that does not sag under full load.

These units are ideaL for both consumer and industrial loads. They will run the items that modified sine wave inverters will not, such as: Laser printers, Photocopiers, Power tools employing "solid state" power or speed control, some battery chargers for cordless tools, X-10 home automation systems and more.

All Feature

- Switching mode design
- High efficiency
- Pure sine wave output voltage
- 12 VDC input and 115 VAC output
- Overload protection
- High output current surge
- Low battery alarm / shut down
- Low idle power draw
- Compact and light weight
- Two output receptacles
- Input via terminals
- 2 year warranty

PST-15S-12

PST-60S-12

PST-100S-12

Model	PST-15S-12	PST-60S-12	PST-100S-12
Part Number	**55105**	**55106**	**55107**
Price	**$149.00**	**$339.00**	**$699.00**
Continuous Output Power	150 W	600 W	1000 W
Input Voltage	10-15 VDC		
Output Voltage	115 V RMS		
Waveform	Pure Sine Wave		
Peak Efficiency	> 90%		
Idle Power Draw	0.85 Amps	0.85 Amps	1.80 Amps
Dimensions (in.) (L x W x H)	7.5 x 4.7 x 2.4	9.3 x 13.2 x 3.3	9.3 x 15.5 x 3.3
Shipping Weight (lbs.)	2.3	6.6	8.8

OutBack Power Systems

OutBack Inverter - Chargers

FX Series

The OutBack FX Inverter is a modular "building" block sine wave inverter / charger which can be used for both small and large power systems. Each OutBack FX inverter / charger module is a complete power conversion system - DC to AC inverter, battery charger and AC transfer switch. Additional inverter / chargers can be connected at anytime in either parallel (120 VAC), series (120/240 VAC), or even three-phase (120Y208 VAC) configurations, allowing the system to be tailored to the specific power conversion requirements of the application, both at the time of the installation and in the future. The FX2000 is also available in export versions. Up to eight FX inverter / charger can be connected together to provide up to 20 kW of continuous power conversion capacity. The OutBack FX inverter / charger system is designed for both residential and commercial stand-alone and utility-interactive applications with battery energy storage.

FX Series
Shown with optional FXA kit

More Features

- Powdercoated all aluminum die-cast chassis
- Internal electronic components are cooled by heat transfer
- Gaskets on all openings to provide water-resistance
- Sealed design protects internal electronics from salt, dirt or contaminated air, bugs, critters, mold etc.
- Conformal coated circuit boards to resist corrosion
- Designed to allow easy field servicing and repair

Applications

- Hot and humid climates where a protected area is not available for installation of the inverter/charger system
- Salt air environments such as Hawaii where you can't get away from the salt air and where there is little difference between indoors and outdoors
- Dirty environments where dust or drifting organic matter such as cottonwood could clog an air openings in an unattended system
- Boats and RV's where water might splash on the inverter
- Greater control of unwanted radio frequency interference

Product Name	FX2012*	FX2012T	FX2024*	FX2024T
Part Number	**55359**	**55360**	**55290**	**55368**
Price	**$1895.00**	**$1995.00**	**$1795.00**	**$1895.00**
Continuous Output Power	1700 VA	2000 VA	2000 VA	2300 VA
Continuous Output Current at 25º	14 amps AC RMS	17 amps AC RMS	17 amps AC RMS	19 amps AC RMS
Idle Power (120 VAC Output No Load)	19 - 21W DC		18 - 20 W DC	
Output Voltage	120 VAC / 60Hz			
DC Input Voltage (Nominal)	12 VDC		24 VDC	
Efficiency - Peak	91%		92%	
Output Voltage Regulation	+/- 2% typical			
Continuous DC Charge Rate	100 Amps DC		55 Amps DC	
Frequency Range	50-70Hz			
DC Input Voltage Range	10 - 16 VDC		20-33 VDC	
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5			
Shipping Weight (lbs.)	60.0	66.0	60.0	66.0

T=Turbo Kit included - Adds approximate 5" to the shipping box
* = Special order only

Product Name	FX2548*	FX2548T	FX2012ET	FX2024ET	FX2348E
Part Number	**55291**	**55369**	**55370**	**55371**	**55372**
Price	**$2245.00**	**$2345.00**	**$1995.00**	**$2095.00**	**$2245.00**
Continuous Output Power	2500 VA	2800 VA	2000 VA	2200 VA	2300 VA
Continuous Output Current at 25°	21 amps AC RMS	23 amps AC RMS	8.7 amps AC RMS	9.5 amps AC RMS	10 amps AC RMS
Idle Power (120 VAC Output No Load)	21-23 W DC		19-21 W DC	18-20 W DC	21-23 W DC
Output Voltage	120 VAC / 60 Hz		230 VAC / 50 Hz		
DC Input Voltage (Nominal)	48 VDC		12 VDC	24 VDC	48 VDC
Efficiency - Peak	93%		91%	92%	93%
Output Voltage Regulation	+/- 2% typical				
Continuous DC Charge Rate	35 Amps DC		100 Amps DC	55 Amps DC	35 Amps DC
Frequency Range	50-70 Hz		40-60 Hz		
DC Input Voltage Range	40-66 VDC		10-16 VDC	20-33 VDC	40-66 VDc
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5				
Shipping Weight (lbs.)	60.0	66.0	66.0	66.0	6.0

* = Special order only

GTFX Series

Finally, OutBack releases its Battery back-up grid-tie systems with battery-less grid-tie system performance.

Features

- UPS grade AC transfer switch system
- Built-in automatic "silent" sell mode
- More tolerant of partially shaded PV arrays
- Easy system expansion and flexible design
- Single, split or three phase AC output
- Up to 72 VDC nominal PV arrays using the MX60
- Long battery life through intelligent control of charging process
- MATE display can be placed indoords with Rs 232 PC connection
- 24 or 48 VDC battery banks
- ETL Listed
- Export versions are available

GTFX Series

Product Name	GTFX 2524 Sealed	GTFX3048 Sealed	GVFX 3524 Vented	GVFX3648 Vented
Part Number	**55364**	**55365**	**55366**	**55367**
Price	**$1995.00**	**$2345.00**	**$2345.00**	**$2345.00**
Continuous Output Power	2500 VA	3000 VA	3500 VA	3600 VA
Continuous Output Current at 25°	21 Amps AC RMS	25 Amps AC RMS	29 Amps AC RMS	30 Amps AC RMS
Idle Power (120 VAC Output No Load)	18-20 W DC	21-23 W DC	18-20 W DC	21-23 W DC
Output Voltage	120 VAC / 60 Hz			
DC Input Voltage (Nominal)	24 VDC	48 VDC	24 VDC	48 VDC
Efficiency - Peak	92%	93%	92%	93%
Output Voltage Regulation	+/- 2% typical			
Continuous DC Charge Rate	55 Amps DC	35 Amps DC	85 Amps DC	45 Amps DC
Frequency Range	Grid-tie mode +/- 5 Hz / Line-tie mode +/- 2.0 Hz			
DC Input Voltage Range	20-33 VDC	40-66 VDC	20-33 VDC	40-66 VDC
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5			
Shipping Weight (lbs.)	66.0	66.0	62.0	62.0

VFX Series

Although OutBack has become known for offering the first and only sealed sinewave inverter/charger, there are some real reasons to consider offering a vented version of the popular FX series as well. Now you can choose from sealed or vented OutBack inverter/chargers depending on the environment of your installation. Up to eight VFX inverters can be connected together to provide up to 28,800 watts of continuous power conversion capacity.

VFX Series

More Features

- Powdercoated all aluminum die-cast chassis
- Internal electronic components are cooled by outside air
- Stainless steel screen to protect air intake and internal fan
- UL 94V0 plastic vent grills to protect the air exhaust. All openings are 0.0025 inches square to keep out dirt, bugs, and other critters.
- Air inlet comes with removable, washable foam filter insert to trap small particles
- Conformal coated circuit boards to resist corrosion
- Higher output power when inverting or battery charging when compared with the sealed FX inverter versions
- Designed to allow easy field servicing and repair

Applications

- Montana or Arizona etc. where salt air is not a problem and climate is dry
- More watts per dollar
- Installations where well protected environments are available

Product Name	VFX2812	VFX3524	VFX3648
Part Number	**55342**	**55341**	**55340**
Price	**$2345.00**	**$2345.00**	**$2345.00**
Continuous Output Power	2800 VA	3500 VA	3600 VA
Continuous Output Current at 25º	23.3 amps AC RMS	29.2 amps AC RMS	30.0 amps AC RMS
Idle Power (120 VAC Output No Load)	19-21 W DC	18-20 W DC	21-23 W DC
Output Voltage	120 VAC / 60 Hz		
DC Input Voltage (Nominal)	12 VDC	24 VDC	48 VDC
Efficiency - Peak	> 90%	92%	93%
Output Voltage Regulation	+/- 2% typical		
Continuous DC Charge Rate	125 amps DC	85 amps DC	45 amps DC
Frequency Range	50-70 Hz		
DC Input Voltage Range	10-16 VDC	20-33 VDC	40-66 VDC
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5		
Shipping Weight (lbs.)	62.0		

Product Name	VFX2612E	VFX3024E	VFX3048E
Part Number	**55352**	**55362**	**55361**
Price	**$2345.00**	**$2345.00**	**$2345.00**
Continuous Output Power	2600 VA	3000 VA	3000 VA
Continuous Output Current at 25º	11.3 amps AC RMS	13.0 amps AC RMS	13.0 amps AC RMS
Idle Power (120 VAC Output No Load)	19 - 21 W DC	18 - 20 W DC	21 - 23 W DC
Output Voltage	230 VAC / 50Hz		
DC Input Voltage (Nominal)	12 VDC	24 VDC	48 VDC
Efficiency - Peak	> 90%		
Output Voltage Regulation	+/- 2% typical		
Continuous DC Charge Rate	100 amps DC	85 amps DC	45 amps DC
Frequency Range	40-60 Hz		
DC Input Voltage Range	10 - 16 VDC	20 - 33 VDC	40 - 66 VDC
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5		
Shipping Weight (lbs.)	62.0		

Mobile Series

Both FX and VFX inverter/chargers are available to be used in RV, marine, truck, and other mobile applications. OutBack Mobile Series supplies smooth, true sine wave AC output power. They are built to survive dust, bugs, even rain and salt air. Choice of sealed FX or bug-proof VFX versions. Installation of the inverter in an RV is now less of a problem.

More Features

- Ultra clean AC power
- Extremely rugged
- Extremely efficient
- Intelligent battery charger
- Very quiet
- Easy system expansion
- Serviceable
- Defeatable neutral to GND switching
- Capabile tech support help
- Coolness factor

Product Name	FX2024M*	FX2024MT	FX2012M*
Part Number	**55354**	**55353**	**55355**
Price	**$1895.00**	**$1995.00**	**$1895.00**
Continuous Output Power	2000 VA	2300 VA	1700 VA
Continuous Output Current at 25º	17 amps AC RMS	19 amps AC RMS	14 amps AC RMS
Idle Power (120 VAC Output No Load)	17-19 W DC	17-19 W DC	19-21 W DC
Output Voltage	120 VAC / 60Hz		
DC Input Voltage (Nominal)	24 VDC	24 VDC	12 VDC
Efficiency - Peak	> 90%		
Output Voltage Regulation	+/- 2% typical		
Continuous DC Charge Rate	55 amps DC	55 amps DC	100 amps DC
Frequency Range	50-70 Hz		
DC Input Voltage Range	20-33 VDC	20-33 VDC	10-16 VDC
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5		
Shipping Weight (lbs.)	60.0	66.0	60.0

Product Name	FX2012MT	VFX3524M	VFX2812M
Part Number	**55356**	**55357**	**55358**
Price	**$1995.00**	**$2345.00**	**$2345.00**
Continuous Output Power	2000 VA	3500 VA	2800 VA
Continuous Output Current at 25º	17 amps AC RMS	29.2 amps AC RMS	23.3 amps AC RMS
Idle Power (120 VAC Output No Load)	19-21 W DC	18-20 W DC	19-21 W DC
Output Voltage	120 VAC / 60Hz		
DC Input Voltage (Nominal)	12 VDC	24 VDC	12 VDC
Efficiency - Peak	> 90%		
Output Voltage Regulation	+/- 2% typical		
Continuous DC Charge Rate	100 amps DC	85 amps DC	125 amps DC
Frequency Range	50 - 70 Hz		
DC Input Voltage Range	10 - 16 VDC	20 - 33 VDC	10 - 16 VDC
Dimensions (in.) (L x W x H)	21.6 x 12.75 x 15.5		
Shipping Weight (lbs.)	66.0	62.0	62.0

* = Special order only

OutBack FX Series Inverter Options

Product Name and Description	Part Number	Price
FX-DCC Aluminum cover protects DC connections and accessories in the DC wiring area.	55292	$65.00
FX-DCA Aluminum conduit adapter required when mounting a FX2000 to an OutBack PSDC or to a 2" conduit.	55293	$45.00
FX-ACA AC wiring compartment extension and 2" conduit adapter.	55294	$35.00
FXA Accessory Kit - Includes FX-DCC, FX-DCA and FX-ACA	55298	$129.00
STACK-2 - Stacking kit for 2 units	53301	$85.00
RTS - Outback Remote Temperature Sensor w/ 20' cable	55300	$29.00
FX Turbo Kit - Cools the sealed inverters for higher power output	55363	$149.00

FX-DCC

OutBack System Management Remote Monitor and Control

The OutBack MATE and MATE2 are complete system controllers and displays for the OutBack FX inverter/charger. They provide a display of operations as well as allow for control and adjustment of the product sepoints. The OutBack MATEs also coordinate the operation of the entire inverter/charger system to maximize performance and to prevent multiple products from conflicting.

Through the use of an OutBack HUB communications manager, a single OutBack MATE, MATE2 or MATE2M is able to connect to multiple FX inverter/chargers and other OutBack products. A maximum of ten OutBack products will be able to be connected to a single MATE via a HUB using CAT 5 type Ethernet cabling with 8 wire RF45 modular connectors.

Product Name and Description	Part Number	Price
MATE (White) - Shipped with 50ft CAT 5 interconnect cable	55296	$295.00
MATE (Black) - Shipped with 50ft CAT 5 interconnect cable	55374	$295.00
MATE2 - Flush mount Mate for wall mounting. Same as standard MATE, except flush mount.	55383	$295.00
MATE2M - Reduced menu (non-grid-tie) for use in RV's and boats.	55384	$219.00
MATE2M/RS232 - Reduced menu version w/RS-232	55385	$295.00
HUB-4 Communications Manager - Allows the MATE to control up to four FX2000 inverters / chargers and MX60 MPPT charge controllers.	55297	$195.00
HUB-10 Communications Manager - Allows the MATE to control up to ten FX2000 and MX60.	55302	$375.00

MATE

MATE2

Sunny Boy

The SMA Sunny Boy inverter is UL 1741 listed and available in North America. Sunny Boy's extensive track record in some of the world's most demanding markets has made it a favorite among PV professionals everywhere. SMA's state of the art maximum power point tracking performance, results in greater real-world energy capture than any other grid-tied PV inverter currently available in the North American marketplace. Sunny Boy's safety and reliability record is also exceptional due to the inverter's redundant grid monitoring and built-in ground fault detection and interruption protection. The inverter's IGBT power stage generates a nearly perfect sine wave with the lowest harmonic distortion in the industry and meets new ultra-strict FCC EMC standards. SMA's unique string inverter technology makes future system expansion simple. Sunny Boy's optional power line carrier communication capability allows for extensive data acquisition from one or many inverters with no additional wiring. Other communication options are available to satisfy almost any application.

Sunny Boy Inverter

Model	700 U no LCD	700 U with LCD	1100 U no LCD	1100 U with LCD
Part Number	**52986**	**52987**	**52984**	**52985**
Price	**$1250.00**	**$1350.00**	**$1470.00**	**$1550.00A S**
AC Input Voltage	120 VAC	120 VAC	240 VAC	240 VAC
Max AC Output Power	700	700	1100	1100
Max DC Voltage	250 VDC	250 VDC	400VDC	400VDC
Max DC Current	6.8A	6.8A	10A	10A
Total Harmonic Distortion	THD < 4%			
Peak Efficiency	93.5%			
Output Frequency	60Hz			
Peak Power Tracking Voltage	156 - 350 VDC			
Cooling	Convection Cooling (No fan)			
Dimensions (in.) (L x W x H)	17.0 x 11.6 x 8.4			
Shipping Weight (lbs.)	40.7	40.7	40.7	59.5

Model	1800 U/W	2500 U/W	2500 208VAC no LCD	2500 208VAC with LCD
Part Number	**52979**	**52981**	**53016**	**53006**
Price	**$2400.00**	**$2600.00**	**$2600.00**	**$2800.00**
AC Input Voltage	120VAC	240VAC	208VAC	208VAC
Max AC Output Power	1800W	2500W	2200W	2200W
Max DC Voltage	400VDC	600VDC	600 VDC	600 VDC
Max DC Current	12A	13A	13A	13A
Total Harmonic Distortion	THD < 4%			
Peak Efficiency	93.5%			
Output Frequency	60Hz			
Peak Power Tracking Voltage	156-350 VDC	234 - 550 VDC		
Cooling	Convection Cooling (No fan)			
Dimensions (in.) (L x W x H)	17.0 x 11.6 x 8.4			
Shipping Weight (lbs.)	59.5	70.5	70.5	70.5

SMA Inverter Accessories

Product Name and Description	Part Number	Price
Sunny Boy Control Ideal for monitoring PV system. Each Control can report on, store information from, and monitor up to 50 SMA inverters.Communication between the Sunny Boy inverters and the Sunny Boy Control can be accomplished through the Powerline, RS 485, or RS 232.	52996	$840.00
Sunny Boy Control Plus Extra analog and digital channels for increased data monitoring, the Control Plus is the foremost tool for PV plant analysis. Additional communication port on the Control Plus can talk to a BetaBrite lobby display in addition to its normal communication channel to a PC.	52305	$2100.00
Sunny Boy Control w/ RS485 This unit is a Sunny Boy Ctonrol with the optional RS485 communciations card installed.	53010	$1200.00
Sunny Boy Plus Control w/ RS485 This unit is a Sunny Boy Ctonrol Plus with the optional RS485 communciations card installed.	53015	$2460.00
SMA SWR-DA-ENG Software The Sunny Data software was developed for convenient PV plant monitoring by PC and is normally based on simple data transmission via Powerline.	52306	N/A
SMA SBC-DA-ENG Software	52307	N/A

Sunny Boy Control

Product Name and Description	Part Number
LCD for 1800/2500 Inverters	52988
RS232 Module Communication option for directly linking one inverter directly to your computer or control	52989
RS232 Module w/ 6.5 ft Cable	52999
RS485 Module	52995
RS485 Cable, 15 meter, shielded	53014
DC Disconnect - Special Fuseless Disconnect	36627
LED Display Board & Beta Brite Lobby Display	53011
Sunny Breeze Fan Kit - For heatsink for 2500U/1800U	52303
SBSL - White/Primed cover for 2500U/1800U with window	52312

Sunny Central 125

The Sunny Central is the culmination of many years of experience with the Sunny Boy and European Sunny Central photovoltaic inverters. The design incorporates the same proven MPP tracker found in more than 100,000 fielded Sunny Boys'. The high efficiency power stage produces a perfect AC sine wave exceeding the latest FCC and IEEE requirements. The AC system isolation transformer is incorporated into the inverter cabinet and is disconnected whenever the inverter is not producing power. This eliminates the unnecessary and costly power losses.

The enclosure is powder-coated aluminum and stainless steel designed for long-term outdoor installation in the harshest of environments. The power electronics are air cooled and protected in an isolated enclosure. The magnetics and isolation transformer are housed in a separate enclosure, thermally isolated from sensitive electronics.

The Sunny Central is equipped with a special version of the Sunny Boy Control Plus advanced data acquisition and control system. A 4-line display and keypad allow simple configuration and system monitoring. A wide variety of different interfaces for plant monitoring and remote configuration with a PC are also available. The Sunny Central Control can acquire data from nearly any known external sensor type for sophisticated plant monitoring and data logging.

The Sunny Central incorporates the same communication protocol found in all SMA PV products. This allows the Sunny Central to be monitored and controlled with the same advanced software found in the Sunny Boy inverter family.

Model	Sunny Central 125
Part Number	52974
Price	$67,000.00
AC Output Voltage	480 VAC
AC Output Frequency	60Hz
DC Input Voltage	275 - 600 VDC
Max AC Output Power	125000
Current THD	THD > 4%
Efficiency - Peak	94%
Max DC Current	400 ADC
PV Start Voltage	300 VDC
Power Consumption	30 W (standby)
Ambient Temperature	-25°C - 50°C
Cooling	Forced fan cooling with optional sealed heat exchanger
Dimensions (in.) (L x W x H)	92.5 x 70.8 x 23.6
Shipping Weight (lbs.)	2645.5

Sunny Cenral 125