Solar Electric Equipment and Balance of System

groSolar™

What the World Needs. NOW

INTRODUCTION

Founded in 1991 and headquartered in Grants Pass, Oregon, Energy Outfitters is one of North America's leading value-added distributors of the world's best-in-class renewable energy products. With four warehousing locations across Canada and the US, we deliver a full range of Photovoltaic, Wind and Micro-hydro solutions to our RE dealer/installer customer – both, as components and as ETL-listed assemblies and systems.

Eric and Dan work together to build a ReadyWatt® integrated, off-grid power center at Energy Outfitters' ETL® certified ReadyWatt® assembly facility in Grants Pass, Oregon.

Energy Outfitters also offers complete engineering/technical-design services and through our many annual events, professional training for all of our renewable energy products and systems. And through our Eastern and Western-US, ETL-listed assembly facilities, we are authorized to integrate and warranty complete renewable energy systems utilizing components from multiple manufacturers under our ReadyWattTM brand

Based on the steady growth of our ReadyWatt product-brand, we have developed this catalog to give you an overview of each of these product segments, including integrated power systems for grid-tie, off-grid, and remote cabins – as well as pass-through and combiner boxes, remote water pumping kits, wire and cables, and RV solar power kits. Each is designed and built to ETL® standards, offering you a pre-fabricated, dependable solution that is code-compliant, aesthetically pleasing, and quick and easy to install.

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NEW! 2800SX Home Energy Appliance

Grid-tied Solar Electric System with Battery Backup

Easy to install and easy to operate, the **ReadyWatt® 2800SX** combines power electronics, batteries, switching, and monitoring into one clean, fully-assembled, compact package – just add PV. All the power electronics are top-of-the-line, field proven components from OutBack Power Systems® and ReadyWatt®. All you have to do is wheel it into place, lock it down, connect the AC and DC, and turn on the power.

- Ships complete–batteries included
- Preprogrammed for optimal operation in most applications
- Field programmable for custom situations

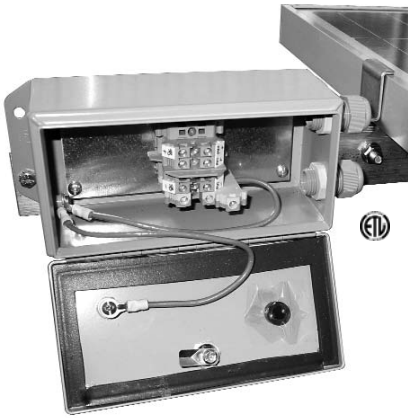
EO Part	600PCIORW2800SX
INVERTER	
Nominal AC Output Voltage / Frequency	120V / 60hz
Cont. AC Output Current at 25°C	30 Amps
AC Input Curr. Max. AC Transfer Switch / Sys. Bypass	50 Amps AC
AC Transfer Switch Speed (typ.)	<16 Milliseconds
Inverter Battery Charge Rate (max.)	45 Amps DC
PHOTOVOLTAIC	
Charge Controller Battery Charge Rate (max.)	60 Amps DC
PV Open Circuit Voltage (start-up & operating)	135 VDC (max.)
Max PV Array Wattage	2880 WDC (STC)
PV Array Ground Fault Protection	Standard
BATTERY	
Nominal Battery Voltage	48 VDC
Backup Capacity (full batteries, 20 hr. discharge rate)	6000 W/h @ 120 VAC
PHYSICAL	
Enclosure Type	NEMA-1 Indoor
Dimensions (approx.)	19"W x 31"D x 45"H
Weight (with batteries)	800 lbs. (approx.)
CERTIFICATION	
ETL® listing to UL® 1741 Standard	Pending

SYSTEM INTEGRATION

At our ETL® listed integration and assembly facility we build equipment to your spec's that improves aesthetics, is code-compliant, and *saves you time and money*.

- ReadyWatt™ Integrated Power Centers
  - Custom-built to your specifications
  - Grid-tied or off-grid
  - ETL® Listed, tested and ready to install
  - Detailed system manual included
- ReadyWatt™ Pre-engineered PV Systems
  - 1.0 to 10.0 kW grid-tied
  - Engineering drawings and manual included
- ReadyWatt™ Custom Built Cables and Hardware
  - Multi-Contact, inverter, and battery cables
  - Array mounted pass-through/junction boxes
- Custom Designed 10 kW to 250 kW+ Systems

MEDIUM PASS-THROUGH BOX



- ReadyWatt Pass-Thru Boxes provide a convenient location to begin the necessary conduit run from the PV array to the power conditioning equipment
- Innovative rail mount allows direct attachment to PV mounting rail, reducing roof penetrations
- Flexible mounting options—can be mounted in any orientation
- The Medium Pass-Thru Box can also serve as a junction box using the provided jumper
- ETL listed to the UL508A standard

EO Part #	600ENCLPTBOXRMM
Voltage	up to 600 volts
Grid or Off-Grid	both
Max # of Input Circuits	2
# Output Circuits	1 or 2
Mounting Plate	steel
Mounting Bar	aluminum - 2”x15”
Enclosure	NEMA 4 - 8”x6”x4”
Touchsafe Fuse Holders	N/A
Fuses- available sizes	N/A
Jumpers	1
DIN rail	1
Ground terminal blocks	1
Negative terminal blocks	2
Positive terminal blocks	2
Cord grips	2

LARGE PASS-THROUGH BOX

- ReadyWatt Pass-Thru Boxes provide a convenient location to begin the necessary conduit run from the PV array to the power conditioning equipment
- Innovative rail mount allows direct attachment to PV mounting rail, reducing roof penetrations
- Flexible mounting options—can be mounted in any orientation
- Large Pass-Thru Box options include low or high voltage fuses for off-grid or grid-tie applications.
- ETL listed to the UL508A standard

EO Part #	600COMBPTBLRG
Voltage	up to 600 volts
Grid or Off-Grid	both
Max # of Input Circuits	3
# Output Circuits	1, 2 or 3 (no paralleling)
Mounting Plate	steel
Mounting Bar	aluminum - 2”x15”
Enclosure	NEMA 4 - 8”x8”x4”
Touchsafe Fuse Holders	125 VDC or 600VDC
Fuses- available sizes	125V or 600V -10A, 15A, 20A
Jumpers	0
DIN rail	1
Ground terminal blocks	1
Negative terminal blocks	3
Positive terminal blocks	3
Cord grips	3

10x10 COMBINER BOX

- ReadyWatt™ Combiner Boxes provide a convenient location to begin the necessary conduit run from the PV array to the power conditioning equipment
- Combiner Box options include low voltage breakers or high voltage fuses for off-grid or grid-tie applications
- Fuses and breakers are specified and purchased separately
- Extra heavy-duty NEMA 3R enclosures
- ETL listed to UL508A standard

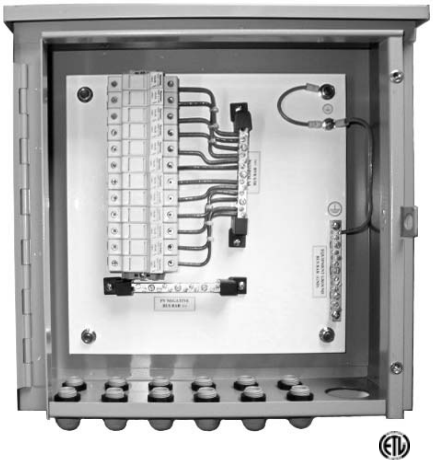
	Low Voltage	High Voltage
EO Part #	600COMB10X10LV	600COMB10X10HV
Voltage	up to 125 volts	up to 600 volts
Grid or Off Grid	off-grid	grid-tie
Max # Input Circuits	6	5
# Output Circuits	1	1
NEMA 3R enclosure	10"x10"x4"	10"x10"x4"
Touchsafe fuse holders	N/A	(5) 30A, 600VDC
Fuse options	N/A	10A, 15A, 20A
Breaker options	10A, 15A, 20A	N/A
DIN rail	1	1
Negative buss bars	1	1
Positive fingered buss bars	1	1
Grounding (block/buss bar)	1 block	1 block
Cord grips	optional	optional

12x12 COMBINER BOX

- ReadyWatt™ Combiner Boxes provide a convenient location to combine PV source circuits for conductor runs to the power conditioning equipment
- Combiner Box options include low voltage breakers or high voltage fuses for off-grid or grid-tie applications
- Fuses and breakers are specified and purchased separately
- Extra heavy-duty NEMA 3R enclosures
- ETL listed to UL508A standard

	Low Voltage	High Voltage
EO Part #	600COMB12X12LV	600COMB12X12HV
Voltage	up to 125 volts	up to 600 volts
Grid or Off Grid	off-grid	grid-tie
Max # Input Circuits	12	8
# Output Circuits	1 or 2	1 or 2
NEMA 3R enclosure	12"x12"x4"	12"x12"x4"
Touchsafe fuse holders	N/A	(8) 30A, 600VDC
Fuse options	N/A	10A, 15A, 20A
Breaker options	10A, 15A, 20A	N/A
DIN rail	1	1
Negative buss bars	2	2
Positive fingered buss bars	2	2
Grounding (block/buss bar)	1 buss bar	1 buss bar
Cord grips	optional	optional

16x16 COMBINER BOX

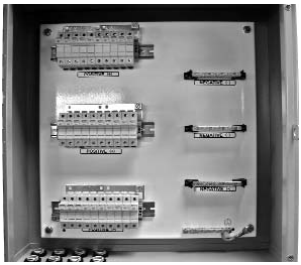


16x16 combiner boxes are designed for high voltage PV strings.

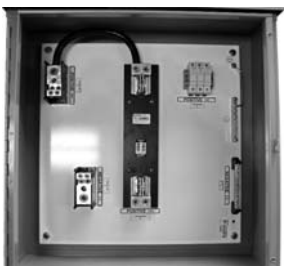
- ReadyWatt™ Combiner Boxes provide a convenient location to begin the necessary conduit run from the PV array to the power conditioning equipment
- Fuses are specified and purchased separately
- Extra heavy-duty NEMA 3R enclosures
- ETL listed to UL508A standard

	High Voltage
EO Part #	600COMB16X16HV
Voltage	up to 600 volts
Grid or Off Grid	grid-tie
Max # Input Circuits	12
# Output Circuits	1
NEMA 3R enclosure	16"x16"x4"
Touchsafe fuse holders	(12) 30A, 600VDC
Fuse options	10A, 15A, 20A
DIN rail	1
Negative buss bars	2
Positive fingered buss bars	2
Grounding (block/buss bar)	1 buss bar
Cord grips	12

CUSTOM COMBINER BOXES



- Combiner boxes built to specification
- Sub-combiner boxes to minimize array to inverter wiring
- ETL listed to UL508A standard
- 600VDC fuses



Energy Outfitters designs and builds a complete line of custom combiner boxes for commercial systems. All boxes are engineered and built to project specifications. Boxes are ETL listed and utilize 600VDC fuses, easily accessible distribution blocks and bus bars.

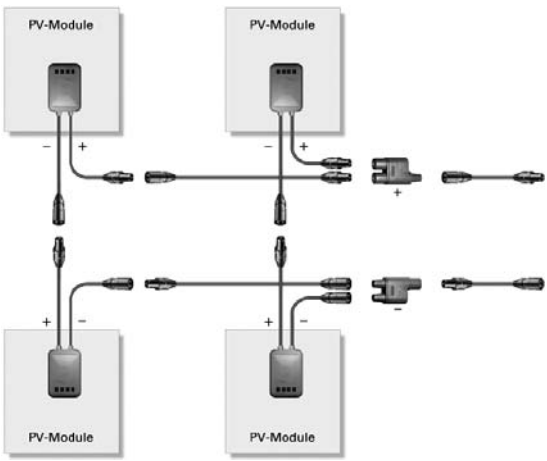
Advantages include reducing total number of combiner boxes on large projects and eliminating multiple wire runs to inverters by combining to a single set of conductors.

Examples of previous boxes built include: combiners for 44 individual strings feeding four separate inverters and sub combiners to combine the outputs of multiple 12 circuit combiners into a single output.

MC® CABLES & FITTINGS

- Current industry standard for connectors
- Polarity protected
- T-branch connectors available
- UV and weather resistant
- Optional locking device
- Wide range of pre-made lengths available
- Touch proof protection

Multi Contact connectors are the industry standard for quick connect systems. Energy Outfitters has been manufacturing cable assemblies with the MC connectors since their release. As cable requirements change and EO will broaden the line of cable assemblies to match the industry needs.



BATTERY CABLES

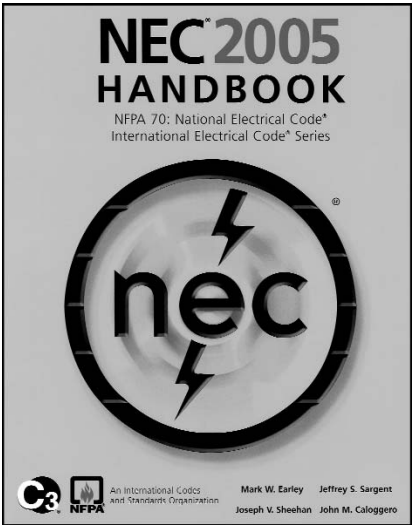
- All cables and connectors UL® listed
- Ideal for battery interconnects and inverter home runs
- Wide variety of lengths and sizes available
- Custom lengths available

ReadyWatt battery and inverter cables are made using Cobra X flex cable and crimp connectors UL listed for Class K fine stranded wire. This cable offers a unique flame retardant polyvinyl chloride compound (VW-1), and is moisture, abrasion, acid, diesel fuel and oil resistant. It is extremely flexible and easy to work with. All connectors are sealed using a glue filled heat shrink to reduce corrosion.

BREAKERS, FUSE HOLDERS...

- Use breakers for battery based systems; breakers should be sized according to the series fuse rating on the back of your PV modules.
- Fuses and fuse holders are used when building high voltage series strings common in grid tied batteryless systems.
- Cable cord grips make a weatherproof entrance into your combiner boxes and provide strain relief on your cables. The 2 sizes of cord grips allow you to use a variety of knockouts present in most combiner boxes.

Part Name	Part Description	EO Part #
Combiner Box Breakers	6A, 9A, 10A, 15A 150VDC. Breakers Din Rail Mounted.	551PVMAOBPV6
		551PVMAOBPV9
		551PVMAOBPV10
		551PVMAOBPV15
Fuse Holder High Voltage	High Voltage (600VDC) Fuse holder. Din Rail Mounted, 30A max.	600COMAFUSEHDHV
Fuses, High Voltage	High voltage touch safe fuses, KLKD type fuses 10A and 15A.	600COMAFUSHV10A
		600COMAFUSHV10A
Cable Cord Grip Bushings ½"	1/2" knock out cable cord Grips. Available with 0,2,3 hole inserts which fit the #10 USE 2 wire.	530CABA1/2SRMC2
		530CABA1/2SRMC3
Cable Cord Grip Bushings 3/4"	3/4" knock out cable cord Grips. Available with 2,3,4,5 hole inserts which fit the #10 USE 2 wire.	530CABA3/4INHL
		530CABA3/4LKNUT
		530CABA3/4IN2HL
		530CABA3/4IN3HL
		530CABA3/4IN4HL
		530CABA3/4IN5HL



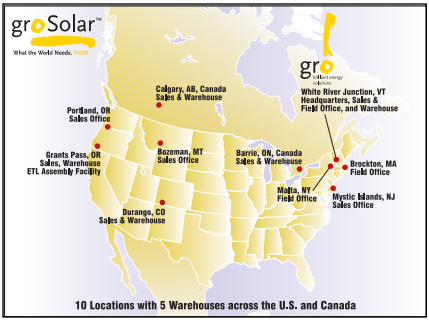
• 690.35 Non-isolated inverters allowed with special provisions

The 2005 National Electric Code has some important changes in section 690. One of the biggest changes is the allowance of non-isolated (transformer less) inverters. There are a number of provisions included in using these new inverters. One includes the necessity of the two-pass PV wire. This wire was specified by UL to meet the intent of the Code. See page 13 of this catalog for more information on two-pass wire. The intent is well described in the NEC 2005 Handbook. Other provisions include disconnect marking, disconnect methods and color coding of conductors.

• 690.31 PV source circuits inside a building

The other major change in the 2005 Code is the clarification of PV source circuits run inside of a structure. Section 690.31(E) indicates that conductors run inside a building or structure shall be contained in metallic raceways from the point of penetration to the first readily accessible disconnecting means.

This clarifies earlier versions of NEC that didn't give concrete provision for running PV conductors inside a building before a disconnect.



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