



SUNSOURCE® Home Energy System

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PRODUCT SPECIFICATIONS




All SunSource® Solar-Ready, Dave Lennox *Signature*® Collection air conditioners and heat pumps are upgradable to the SunSource® Home Energy System.

Units can be upgraded at the time of installation or in the future.

Solar energy is first used to meet cooling/heating demands. When the cooling and heating system is not operating, the system powers lighting, appliances and other electronic devices in the home. And in some locations, any surplus power is sent back to the utility company for a possible credit (check with your local utility company for availability).

The SunSource system consists of the following components:

- Lennox Solar Sub-Panel field installed in a Dave Lennox *Signature*® Collection air conditioner or heat pump unit.
- SolarWorld Pre-Engineered Kits consisting of:
 - SolarWorld Solar Modules (1 to 16 may be used to vary the amount of electricity generated).
 - Enphase Microinverter that converts Direct Current to Alternating Current.
 - Enphase Envoy Communications Gateway for solar power performance monitoring.
 - Roof Mounting Components.

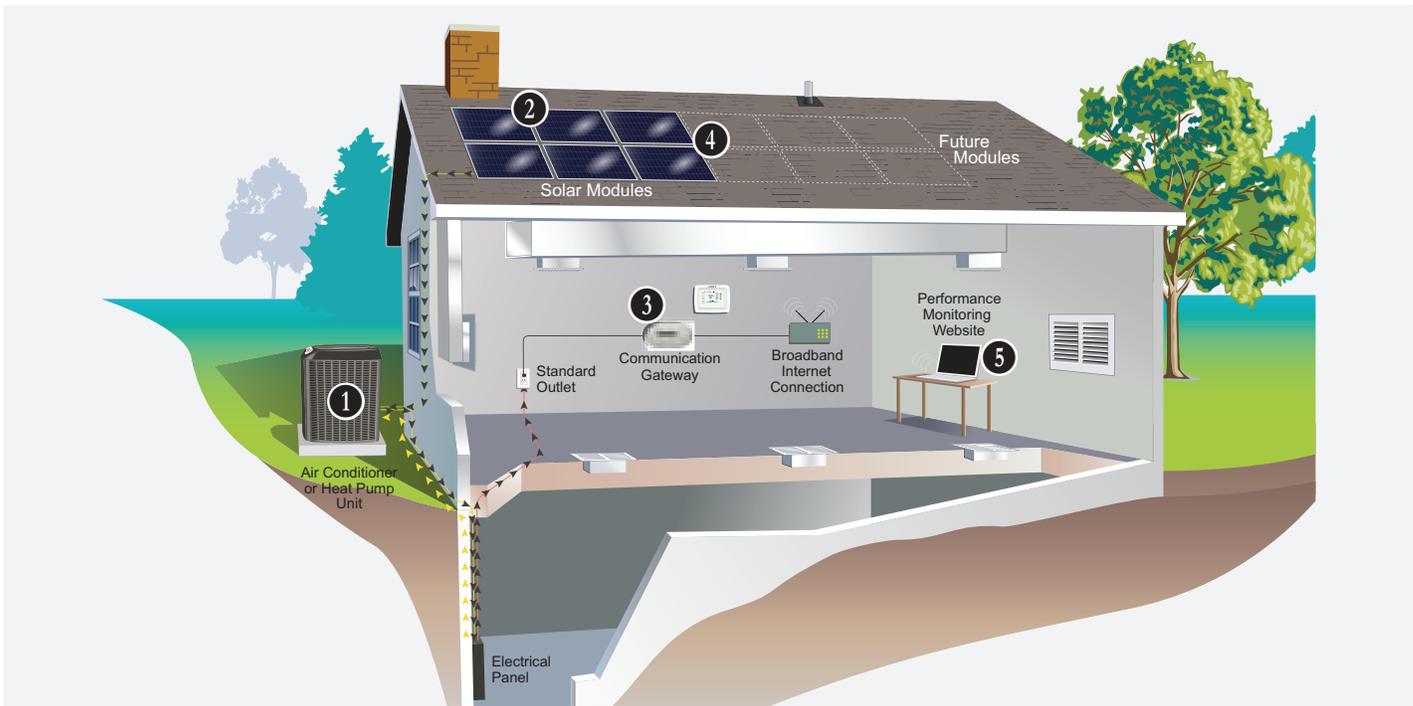
Wiring from the roof mounted solar modules is routed to the outdoor unit. From there power travels to the home electrical service panel using the existing outdoor unit power wiring.

Refer to **SunSource® Home Energy System Applications and Design Guidelines** Manual (Corp. 1312-L2) for information on designing, sizing and installing a complete system.

APPROVALS

The SunSource® Home Energy System meets the requirements for federal tax credit eligibility listed under the U.S. Emergency Economic Stabilization Act of 2008, covering 30% of the cost of the solar modules, including installation.

SUNSOURCE® HOME ENERGY SYSTEM - OVERVIEW



- 1 Dave Lennox *Signature*® Collection Air Conditioner or Heat Pump with field installed Lennox® Solar Subpanel installed:
XC25 Variable Capacity, XC21 Two-Stage or XC17 Single-Stage Air Conditioner
XP25 Variable Capacity, XP21 Two-Stage or XP17 Single-Stage Heat Pump
- 2 SolarWorld Solar Modules (1 to 16) convert sunlight into electricity to operate SunSource® Solar-Ready outdoor unit. When outdoor unit is not operating, surplus power is used in the home to power appliances and other devices.
- 3 Enphase Microinverter, converts Direct Current (DC) to Alternating Current (AC) power. Each solar module is paired with one Enphase Microinverter.
- 4 Enphase Envoy Communications Gateway sends data to website for online monitoring.
Standard Electrical Outlet allows Gateway to detect Solar Module data from existing power wires.
Broadband Internet Connection connect to online website for monitoring.
- 5 Enphase Enlighten™ Performance Monitoring Website allows homeowner to see how the home energy system is working to lower utility operating costs. It also shows the environmental benefits of using renewable energy for the home.

WARRANTY

XC25/XP25, XC21/XP21 and XC17/XP17 Solar-Ready Heat Pumps And Air Conditioners:

Compressor - limited warranty for ten years in residential installations and five years in non-residential installations.

All other covered outdoor unit components - ten years in residential installations and one year in non-residential installations.

Refer to Lennox Equipment Limited Warranty certificate included with unit for specific details.

Solar Modules - 10-year limited warranty. 25-year limited performance guarantee that covers a 97% output for one year and an annual solar module output decline of less than 0.7% for 24 years.

Enphase Microinverter - 15-year limited warranty.

Enphase Envoy Communications Monitor - 1-year limited warranty.

Roof Mounting System Components - 25-Year limited warranty.

SUNSOURCE® HOME ENERGY SYSTEM - COMPONENTS

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FEATURED SYSTEM COMPONENTS

Dave Lennox Signature® Collection XC25 Variable Capacity Air Conditioners



ENERGY STAR® qualified.
Up to 26.00 SEER efficiency.
icomfort®-enabled control.
Precise Comfort™ Technology.
SilentComfort™ technology.
Quiet operation, as low as 59 dB.
R-410A refrigerant.
Dependable and efficient variable capacity scroll compressor.

SmartHinge™ louvered coil protection.

Optimized for use with the *Humiditrol*® whole-home dehumidification system.

Dave Lennox Signature® Collection XP25 Variable Capacity Heat Pumps

ENERGY STAR® qualified.
Up to 23.50 SEER efficiency.
icomfort®-enabled control.
Precise Comfort™ Technology.
SilentComfort™ technology.
Quiet operation, as low as 58 dB.
R-410A refrigerant.
Dependable and efficient variable capacity scroll compressor.

SmartHinge™ louvered coil protection.

Optimized for use with the *Humiditrol*® whole-home dehumidification system.

Also available - XC21 Two-Stage, XC17 Single-Stage Air Conditioners and XP21 Two-Stage, XP17 Single-Stage Heat Pumps.

See separate Product Specifications bulletins for complete information.

BASIC SYSTEM REQUIREMENTS

Sufficient open roof space.
Broadband Internet connection (preferred).
Homeowner Association approval (where applicable).
240 VAC, single phase electrical service.
Grid Interconnection Agreement.

LENNOX® SOLAR SUB-PANEL



The Lennox® Solar Sub-Panel replaces the factory piping panel on the outdoor unit and provides circuit breaker protection and power entry for both HVAC (line) and solar power wiring.

Sub-Panel is equipped with separate circuit breakers for both HVAC (line) voltage and solar power.

Equipped with pigtail connections for easy field wiring.

Sub-Panel is an ETL listed accessory.

Split design (upper/lower panel) allows installation on different size outdoor units.

Sub-Panel is furnished with three separate lower panels.

NOTE - Sub-Panel is not backwards compatible with older “non-Solar-Ready” Dave Lennox *Signature*® Collection outdoor units.

Disconnects for HVAC (line) and solar power wiring are not furnished and must be field provided.

SOLAR MODULES



Captures solar energy to convert into AC power through the Enphase Microinverter.

Laminated solar module structure consists of the solar glass, two ethylene vinyl acetate (EVA) sheets, the solar cell matrix and a back sheet.

Thick low-iron safety glass withstands extreme weather conditions and heavy snow loads.

Solar modules are ETL/Intertek listed for the US and Canada to UL Standard 1703 and meet National and Canadian Electrical Code requirements.

Solar Module Frame

Available in black or clear anodized aluminum frame with cast aluminum corner keys.

Low profile with extended flange.

Compatible with “top-down” and “bottom-up” mounting methods.

Eight grounding locations (Four corners of the frame and four locations along the length of the module in the extended flange).

Extended cable lengths for easier installation.

SYSTEM MONITORING

Enphase Envoy Communications Gateway (Communications Booster Furnished)

The Enphase Envoy Communications Gateway monitors Enphase Microinverter (on solar modules) performance and can be connected to a broadband internet connection to send data to the Enphase Enlighten™ web site for online monitoring by the homeowner. The Enphase Envoy Communications Gateway is not required, but must be used if system performance monitoring is desired.



Limited system monitoring is also available locally with the Envoy and a personal computer if no internet connection is available.

Various Event Messages are also available when monitoring the system via a personal computer locally.

Contents - (1) Envoy Communications Gateway, (1) Communications Booster, (1) 6 ft. power cord, (1) 10 ft. Ethernet cable, communications booster.

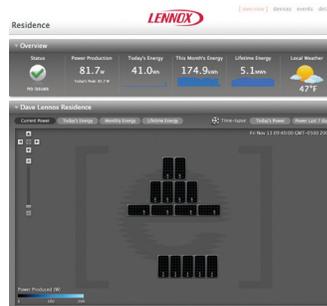
CSA (US/C) listed.

The Enphase Envoy Communications Gateway includes a Communications Booster which may or may not be needed depending upon how far the Envoy is away from the solar modules.

Communications Booster

Ethernet bridge signal booster for the Enphase Envoy Communications Gateway. Booster is only needed if the communications gateway is installed and signal is not strong enough in the installed location. Allows the unit to be plugged into an outlet closer to the distribution panel, yet still plug into the broadband router.

Enphase Enlighten™ Performance Monitoring Website



Powered by the Enphase Envoy Communications Gateway, the Enphase Enlighten™ Performance Monitoring website allows the homeowner to keep track of home energy usage and see environmental benefits in real time. Also aids in troubleshooting any solar-related issues.

See demos, view reference installations and other additional information at:

<http://enlighten.enphaseenergy.com/>

ORDERING INFORMATION

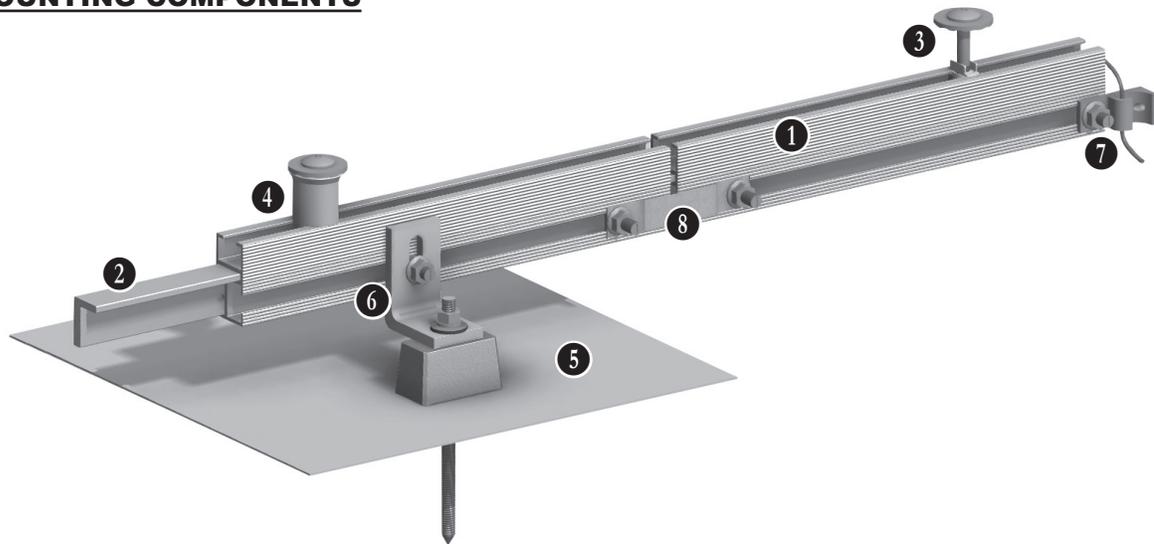
SEE PAGE 14 FOR SOLARWORLD® PRE-ENGINEERED KITS - ORDERING PROCESS FOR DEALERS.

Freight WILL be included in kit pricing. Individual component orders for replacement/repair will NOT include shipping.

All sales are **FINAL** unless accompanied by a claim notification from SolarWorld and a valid Return Merchandise Authorization (RMA). Lennox warehouses will NOT be set up to accept returned product.

Damaged/lost goods during shipping: Must be immediately noted on the shipping note, signed by deliverer and faxed to SolarWorld (805-388-6395).

ROOF MOUNTING COMPONENTS



- 1 **Rails** - Provides a mounting surface for Solar Modules in portrait orientation using associated hardware. Serrations on sides of rails provide a secure and stable mating surface for hardware (L-Brackets, Rail Splice Ground Jumper, Ground Lug). Available in 122 in. (3099 mm) and 162 in. (4115 mm) lengths.
- 2 **Rail Splice Bar Connector** - For connecting two lengths of rail together. No fasteners required. Pin on center of splice leaves a gap between rails to allow for thermal expansion.
- 3 **Top Clamp Assembly (Silver or Black)** - M8 T40 bolt with channel nut, bolt positioning retainer and serrated module clamping washer. Inserts into rail slot to secure modules and set spacing in-between each one.
- 4 **End Clamp Aluminum Spacer (Silver or Black)** - Used with Top Clamp Assembly for securing the end of module mounting row.
- 5 **Composition Roof Mount/Flashing (Mil Aluminum or Bronze)** - Provides roof mounting surface for mounting system. Size - 12 x 12 in. (305 x 305 mm). Base block, hanger bolt and hardware furnished. Adds 1-1/4 in. (32 mm) height below the L-Bracket.
- 6 **L-Bracket** - Clear anodized aluminum with serrated mating surface. Fastens rail to Roof Mount/Flashing. Has two 1 in. (25 mm) slots that provide adjustment from 2-1/2 to 3-1/2 in. (64 to 89 mm).
- Wire Clip (not shown)** - Provides wire management for solar array wiring. Fastens to edge of rail. For 10 AWG. See Page 16.
- Ground Lug (not shown)** - Tin plated, WEEB 8.0, lay-in type. Mounts to corner of solar module. See Page 16.
- 7 **Rail-Equipment Ground WEEB 8.0 Lug** - T-bolt slides into rail for secure connection.
- 8 **Rail Splice Ground Jumper** - WEEB 8.0, pre-assembled with T-bolts. Electrically bonds rails together. Required at each rail splice.

Rooftop Junction Box (not shown) - Soladeck JBox with flashing. Used to transition from the AC-Interconnection cable to wiring/conduit to the outdoor unit. ETL-listed weather-tight enclosure. See Page 16.

Passthru Kit (not shown) - Used with Rooftop Junction Box. One-branch AC passthru kits. Contains all necessary wiring hardware. See Page 16.

ENPHASE ENGAGE CABLE COMPONENTS

Enphase Engage Cable - The Engage Cable (shown with connector) is a 12 AWG cable with pre-installed connectors (portrait aligned) that plug into the Microinverter. Four wire cable (240V single-phase).



Enphase Engage Cable Terminator - Each Engage Cable is terminated at a junction or combiner box. The opposite end of the cable must be terminated with an Engage Cable Terminator cap.



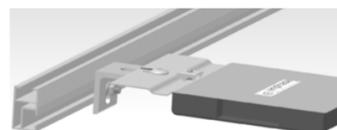
Enphase Engage Disconnect Tool - Specialized tool that disconnects the Engage Cable from a Microinverter or watertight sealing cap.



Enphase Engage Water-tight Sealing Cap - Use when open connections on the Engage Cable are not mated to a Microinverter.



ENPHASE MICROINVERTER MOUNTING

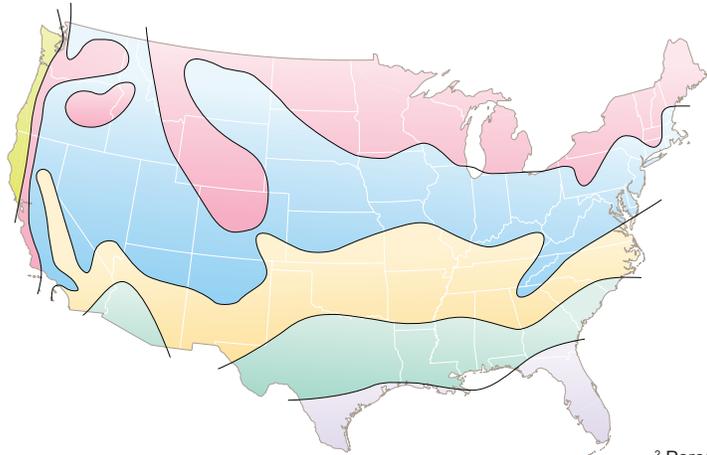


L-Bracket and associated hardware to mount microinverter to rail.

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

Overall Impact of the SunSource® Home Energy System on Heating and Cooling Costs

CLIMATE REGIONS



- Region 1
- Region 2
- Region 3
- Region 4
- Region 5
- Region 6

Estimated annual operating cost savings¹ of heat pump (HP) and air conditioner (AC) with solar modules, compared to a 10 SEER air conditioner (AC) or a 10 SEER/7.0 HSPF heat pump (HP).

NOTE - Air conditioners typically only run during the summer, so they have lower annual operating costs than heat pumps, which are used year round for heating and cooling needs. Less annual energy consumption for air conditioners translates to greater savings percentages.

¹ Equipment cost-savings estimates are based on the U.S. Department of Energy (DOE) annual performance factor (APF) method for heat pumps (10CFR part 430). Estimates of annual solar energy production are calculated for a centrally located city in each DOE heating region, using National Renewable Energy Laboratory's (NREL) PVWatts, Version 1.

² Percent savings for Canada based on 2750 heating load hours (same as US region 5). Northern regions of Canada may have even higher heating load hours.

XC25-024 (2 TON) AIR CONDITIONER

Number of Solar Modules (275W)

Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	70%	76%	83%	90%	96%	103%	109%	116%	123%	129%	136%	142%	149%	156%	162%	169%
2	72%	81%	90%	99%	108%	117%	126%	135%	144%	153%	162%	171%	180%	189%	199%	208%
3	78%	92%	107%	122%	136%	151%	165%	180%	195%	209%	224%	239%	253%	268%	282%	297%
4	83%	102%	121%	141%	160%	179%	199%	218%	238%	257%	276%	296%	315%	335%	354%	373%
5 (includes Canada ²)	97%	130%	163%	197%	230%	264%	297%	331%	364%	398%	431%	465%	498%	531%	565%	598%
6	130%	196%	262%	329%	395%	462%	528%	594%	661%	727%	793%	860%	926%	993%	1059%	1125%

XC25-036 (3 TON) AIR CONDITIONER

Number of Solar Modules (275W)

Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	62%	67%	71%	75%	80%	84%	89%	93%	97%	102%	106%	111%	115%	119%	124%	128%
2	64%	70%	76%	82%	88%	94%	100%	106%	112%	118%	124%	130%	136%	142%	148%	154%
3	67%	77%	87%	97%	106%	116%	126%	136%	145%	155%	165%	175%	184%	194%	204%	214%
4	71%	84%	97%	109%	122%	135%	148%	161%	174%	187%	200%	213%	226%	239%	252%	265%
5 (includes Canada ²)	80%	102%	125%	147%	169%	192%	214%	236%	258%	281%	303%	325%	348%	370%	392%	415%
6	102%	146%	191%	235%	279%	323%	368%	412%	456%	500%	545%	589%	633%	677%	722%	766%

XC25-048 (4 TON) AIR CONDITIONER

Number of Solar Modules (275W)

Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	55%	58%	62%	65%	68%	72%	75%	78%	82%	85%	88%	92%	95%	98%	101%	105%
2	56%	61%	65%	70%	74%	79%	83%	88%	92%	97%	102%	106%	111%	115%	120%	124%
3	59%	67%	74%	81%	88%	96%	103%	110%	118%	125%	132%	140%	147%	154%	162%	169%
4	62%	71%	81%	91%	100%	110%	120%	129%	139%	149%	159%	168%	178%	188%	197%	207%
5 (includes Canada ²)	69%	85%	102%	119%	136%	152%	169%	186%	202%	219%	236%	253%	269%	286%	303%	319%
6	85%	118%	151%	185%	218%	251%	284%	317%	351%	384%	417%	450%	483%	517%	550%	583%

XC25-060 (5 TON) AIR CONDITIONER

Number of Solar Modules (275W)

Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	53%	56%	58%	61%	64%	66%	69%	72%	74%	77%	80%	82%	85%	87%	90%	93%
2	54%	58%	61%	65%	68%	72%	76%	79%	83%	87%	90%	94%	97%	101%	105%	108%
3	56%	62%	68%	74%	80%	86%	91%	97%	103%	109%	115%	121%	126%	132%	138%	144%
4	58%	66%	74%	81%	89%	97%	105%	112%	120%	128%	136%	144%	151%	159%	167%	175%
5 (includes Canada ²)	64%	77%	91%	104%	117%	131%	144%	157%	171%	184%	198%	211%	224%	238%	251%	264%
6	77%	104%	130%	157%	183%	210%	236%	263%	289%	316%	343%	369%	396%	422%	449%	475%

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

XP25-024 (2 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	58%	63%	69%	75%	80%	86%	91%	97%	102%	108%	114%	119%	125%	130%	136%	142%
2	52%	58%	63%	69%	75%	81%	86%	92%	98%	104%	109%	115%	121%	127%	132%	138%
3	45%	51%	57%	62%	68%	74%	79%	85%	91%	96%	102%	108%	113%	119%	125%	130%
4	39%	43%	47%	51%	55%	59%	63%	67%	71%	75%	79%	83%	87%	91%	95%	99%
5 (includes Canada ²)	37%	40%	43%	46%	49%	52%	55%	58%	61%	64%	67%	70%	73%	76%	79%	82%
6	35%	41%	46%	52%	58%	63%	69%	75%	80%	86%	91%	97%	103%	108%	114%	120%

XP25-036 (3 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	56%	60%	64%	68%	72%	76%	80%	84%	88%	92%	96%	100%	103%	107%	111%	115%
2	52%	57%	61%	65%	70%	74%	78%	83%	87%	91%	96%	100%	105%	109%	113%	118%
3	47%	51%	56%	61%	66%	70%	75%	80%	85%	89%	94%	99%	104%	108%	113%	118%
4	41%	44%	48%	52%	55%	59%	62%	66%	70%	73%	77%	80%	84%	88%	91%	95%
5 (includes Canada ²)	37%	40%	43%	46%	49%	52%	55%	58%	61%	63%	66%	69%	72%	75%	78%	81%
6	36%	41%	47%	52%	57%	63%	68%	74%	79%	84%	90%	95%	101%	106%	112%	117%

XP25-048 (4 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	53%	56%	59%	62%	65%	68%	71%	74%	77%	80%	84%	87%	90%	93%	96%	99%
2	51%	54%	58%	61%	65%	68%	72%	75%	79%	82%	86%	89%	93%	96%	100%	103%
3	47%	51%	55%	59%	63%	67%	71%	75%	79%	83%	87%	91%	96%	100%	104%	108%
4	42%	45%	48%	52%	55%	58%	62%	65%	68%	72%	75%	78%	81%	85%	88%	91%
5 (includes Canada ²)	39%	41%	44%	47%	50%	53%	55%	58%	61%	64%	67%	69%	72%	75%	78%	80%
6	37%	42%	47%	53%	58%	63%	68%	73%	79%	84%	89%	94%	100%	105%	110%	115%

XP25-060 (5 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	51%	54%	56%	59%	61%	64%	66%	69%	71%	74%	76%	78%	81%	83%	86%	88%
2	49%	52%	55%	58%	61%	64%	67%	70%	73%	76%	79%	82%	85%	88%	91%	93%
3	46%	50%	53%	57%	60%	64%	68%	71%	75%	78%	82%	86%	89%	93%	96%	100%
4	42%	45%	48%	51%	54%	57%	60%	63%	66%	69%	72%	75%	78%	81%	85%	88%
5 (includes Canada ²)	39%	42%	44%	47%	50%	52%	55%	58%	60%	63%	66%	68%	71%	74%	76%	79%
6	37%	42%	47%	52%	57%	62%	67%	72%	77%	82%	87%	92%	97%	102%	107%	112%

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

XC21-024 (2 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	52%	59%	66%	72%	79%	86%	92%	99%	105%	112%	119%	125%	132%	138%	145%	152%
2	55%	64%	73%	82%	91%	100%	109%	118%	127%	136%	145%	154%	163%	172%	181%	190%
3	60%	75%	90%	104%	119%	134%	148%	163%	177%	192%	207%	221%	236%	250%	265%	280%
4	65%	85%	104%	123%	143%	162%	182%	201%	220%	240%	259%	279%	298%	317%	337%	356%
5 (includes Canada ²)	79%	113%	146%	180%	213%	247%	280%	313%	347%	380%	414%	447%	481%	514%	548%	581%
6	112%	179%	245%	311%	378%	444%	511%	577%	643%	710%	776%	843%	909%	975%	1042%	1108%

XC21-036 (3 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	51%	55%	60%	64%	69%	73%	77%	82%	86%	91%	95%	99%	104%	108%	113%	117%
2	52%	59%	65%	71%	77%	83%	89%	95%	101%	107%	113%	119%	125%	131%	137%	143%
3	56%	66%	76%	85%	95%	105%	115%	124%	134%	144%	154%	163%	173%	183%	193%	202%
4	59%	72%	85%	98%	111%	124%	137%	150%	163%	176%	189%	202%	215%	227%	240%	253%
5 (includes Canada ²)	69%	91%	113%	136%	158%	180%	203%	225%	247%	269%	292%	314%	336%	359%	381%	403%
6	91%	135%	179%	224%	268%	312%	356%	401%	445%	489%	533%	578%	622%	666%	710%	755%

XC21-048 (4 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	46%	49%	52%	56%	59%	62%	65%	69%	72%	75%	79%	82%	85%	89%	92%	95%
2	47%	51%	56%	60%	65%	69%	74%	78%	83%	87%	92%	96%	101%	106%	110%	115%
3	50%	57%	64%	72%	79%	86%	93%	101%	108%	115%	123%	130%	137%	145%	152%	159%
4	52%	62%	71%	81%	91%	100%	110%	120%	130%	139%	149%	159%	168%	178%	188%	197%
5 (includes Canada ²)	59%	76%	92%	109%	126%	143%	159%	176%	193%	210%	226%	243%	260%	276%	293%	310%
6	76%	109%	142%	175%	208%	242%	275%	308%	341%	374%	408%	441%	474%	507%	540%	573%

XC25-060 (5 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	43%	45%	48%	51%	53%	56%	59%	61%	64%	67%	69%	72%	74%	77%	80%	82%
2	44%	47%	51%	55%	58%	62%	65%	69%	73%	76%	80%	83%	87%	91%	94%	98%
3	46%	52%	58%	63%	69%	75%	81%	87%	93%	99%	104%	110%	116%	122%	128%	134%
4	48%	56%	63%	71%	79%	87%	94%	102%	110%	118%	125%	133%	141%	149%	156%	164%
5 (includes Canada ²)	53%	67%	80%	94%	107%	120%	134%	147%	161%	174%	187%	201%	214%	227%	241%	254%
6	67%	93%	120%	146%	173%	199%	226%	253%	279%	306%	332%	359%	385%	412%	438%	465%

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

XP21-024 (2 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	46%	52%	58%	63%	69%	74%	80%	86%	91%	97%	102%	108%	113%	119%	125%	130%
2	42%	48%	54%	59%	65%	71%	76%	82%	88%	94%	99%	105%	111%	117%	122%	128%
3	37%	43%	48%	54%	60%	65%	71%	77%	82%	88%	94%	99%	105%	111%	116%	122%
4	32%	36%	40%	44%	48%	52%	56%	60%	64%	68%	72%	76%	80%	84%	88%	92%
5 (includes Canada ²)	30%	33%	36%	39%	42%	45%	48%	51%	54%	57%	60%	63%	66%	69%	72%	75%
6	29%	34%	40%	46%	51%	57%	63%	68%	74%	80%	85%	91%	97%	102%	108%	113%

XP21-036 (3 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	47%	51%	55%	59%	62%	66%	70%	74%	78%	82%	86%	90%	94%	98%	102%	106%
2	44%	48%	53%	57%	62%	66%	70%	75%	79%	83%	88%	92%	96%	101%	105%	109%
3	40%	45%	50%	55%	59%	64%	69%	74%	78%	83%	88%	93%	97%	102%	107%	112%
4	36%	40%	43%	47%	51%	54%	58%	62%	65%	69%	72%	76%	80%	83%	87%	90%
5 (includes Canada ²)	34%	37%	40%	43%	46%	49%	51%	54%	57%	60%	63%	66%	69%	72%	75%	78%
6	33%	38%	43%	49%	54%	60%	65%	71%	76%	81%	87%	92%	98%	103%	108%	114%

XP21-048 (4 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	44%	47%	50%	53%	56%	59%	62%	65%	68%	71%	74%	77%	80%	83%	86%	89%
2	41%	45%	48%	52%	55%	59%	62%	66%	70%	73%	77%	80%	84%	87%	91%	94%
3	38%	42%	46%	50%	54%	58%	62%	66%	71%	75%	79%	83%	87%	91%	95%	99%
4	34%	37%	40%	43%	47%	50%	53%	57%	60%	63%	67%	70%	73%	77%	80%	83%
5 (includes Canada ²)	31%	33%	36%	39%	42%	45%	47%	50%	53%	56%	58%	61%	64%	67%	70%	72%
6	30%	35%	40%	45%	51%	56%	61%	66%	71%	77%	82%	87%	92%	97%	103%	108%

XP21-060 (5 TON) HEAT PUMP

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	44%	46%	49%	51%	54%	56%	59%	61%	64%	66%	69%	71%	73%	76%	78%	81%
2	42%	45%	48%	51%	54%	57%	60%	63%	65%	68%	71%	74%	77%	80%	83%	86%
3	39%	42%	46%	50%	53%	57%	60%	64%	67%	71%	75%	78%	82%	85%	89%	92%
4	34%	37%	41%	44%	47%	50%	53%	56%	59%	62%	65%	68%	71%	74%	77%	80%
5 (includes Canada ²)	31%	34%	37%	39%	42%	45%	47%	50%	53%	55%	58%	61%	63%	66%	69%	71%
6	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%	105%

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

XC17-024 (2 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	41%	48%	55%	61%	68%	74%	81%	88%	94%	101%	108%	114%	121%	127%	134%	141%
2	44%	53%	62%	71%	80%	89%	98%	107%	116%	125%	134%	143%	152%	161%	170%	179%
3	49%	64%	79%	93%	108%	122%	137%	152%	166%	181%	196%	210%	225%	239%	254%	269%
4	54%	74%	93%	112%	132%	151%	170%	190%	209%	229%	248%	267%	287%	306%	326%	345%
5 (includes Canada ²)	68%	102%	135%	169%	202%	235%	269%	302%	336%	369%	403%	436%	470%	503%	536%	570%
6	101%	168%	234%	300%	367%	433%	500%	566%	632%	699%	765%	832%	898%	964%	1031%	1097%

XC17-030 (2.5 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	44%	49%	54%	59%	65%	70%	75%	81%	86%	91%	96%	102%	107%	112%	118%	123%
2	45%	53%	60%	67%	74%	82%	89%	96%	103%	110%	118%	125%	132%	139%	147%	154%
3	50%	62%	73%	85%	97%	108%	120%	132%	143%	155%	167%	179%	190%	202%	214%	225%
4	54%	69%	85%	100%	116%	131%	147%	162%	178%	193%	209%	224%	240%	255%	271%	286%
5 (includes Canada ²)	65%	92%	118%	145%	172%	199%	226%	252%	279%	306%	333%	359%	386%	413%	440%	466%
6	91%	144%	198%	251%	304%	357%	410%	463%	516%	569%	623%	676%	729%	782%	835%	888%

XC17-036 (3 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	40%	45%	49%	54%	58%	62%	67%	71%	76%	80%	84%	89%	93%	98%	102%	106%
2	42%	48%	54%	60%	66%	72%	78%	84%	90%	96%	102%	108%	114%	120%	126%	132%
3	46%	55%	65%	75%	85%	94%	104%	114%	124%	133%	143%	153%	163%	172%	182%	192%
4	49%	62%	75%	88%	101%	113%	126%	139%	152%	165%	178%	191%	204%	217%	230%	243%
5 (includes Canada ²)	58%	81%	103%	125%	147%	170%	192%	214%	237%	259%	281%	304%	326%	348%	370%	393%
6	80%	124%	169%	213%	257%	302%	346%	390%	434%	479%	523%	567%	611%	656%	700%	744%

XC17-042 (3.5 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	40%	44%	47%	51%	55%	59%	62%	66%	70%	74%	78%	81%	85%	89%	93%	96%
2	41%	46%	51%	57%	62%	67%	72%	77%	82%	88%	93%	98%	103%	108%	113%	118%
3	44%	53%	61%	69%	78%	86%	94%	103%	111%	119%	128%	136%	145%	153%	161%	170%
4	47%	58%	69%	80%	91%	102%	114%	125%	136%	147%	158%	169%	180%	191%	202%	213%
5 (includes Canada ²)	55%	74%	93%	112%	132%	151%	170%	189%	208%	227%	246%	265%	284%	304%	323%	342%
6	74%	112%	150%	188%	226%	264%	302%	339%	377%	415%	453%	491%	529%	567%	605%	643%

XC17-048 (4 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	36%	39%	42%	46%	49%	52%	56%	59%	62%	66%	69%	72%	75%	79%	82%	85%
2	37%	41%	46%	51%	55%	60%	64%	69%	73%	78%	82%	87%	91%	96%	100%	105%
3	40%	47%	54%	62%	69%	76%	84%	91%	98%	106%	113%	120%	127%	135%	142%	149%
4	42%	52%	62%	71%	81%	91%	100%	110%	120%	129%	139%	149%	159%	168%	178%	188%
5 (includes Canada ²)	49%	66%	83%	99%	116%	133%	150%	166%	183%	200%	216%	233%	250%	267%	283%	300%
6	66%	99%	132%	165%	198%	232%	265%	298%	331%	364%	398%	431%	464%	497%	530%	564%

XC17-060 (5 TON) AIR CONDITIONER

Number of Solar Modules (275W)																
Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	39%	42%	44%	47%	50%	52%	55%	58%	60%	63%	66%	68%	71%	73%	76%	79%
2	40%	44%	47%	51%	54%	58%	62%	65%	69%	73%	76%	80%	83%	87%	91%	94%
3	42%	48%	54%	60%	66%	71%	77%	83%	89%	95%	101%	107%	112%	118%	124%	130%
4	44%	52%	60%	67%	75%	83%	91%	98%	106%	114%	122%	129%	137%	145%	153%	161%
5 (includes Canada ²)	50%	63%	77%	90%	103%	117%	130%	143%	157%	170%	184%	197%	210%	224%	237%	250%
6	63%	90%	116%	143%	169%	196%	222%	249%	275%	302%	329%	355%	382%	408%	435%	461%

ESTIMATED ANNUAL OPERATING COSTS SAVINGS

XP17-024 (2 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	43%	49%	55%	60%	66%	71%	77%	83%	88%	94%	99%	105%	110%	116%	122%	127%
2	40%	46%	52%	58%	63%	69%	75%	81%	86%	92%	98%	104%	109%	115%	121%	126%
3	37%	42%	48%	54%	59%	65%	71%	76%	82%	88%	93%	99%	105%	110%	116%	122%
4	33%	37%	41%	45%	49%	53%	57%	61%	65%	69%	73%	77%	81%	85%	89%	93%
5 (includes Canada ²)	32%	35%	38%	41%	44%	47%	50%	53%	56%	59%	62%	65%	68%	71%	74%	77%
6	30%	36%	42%	47%	53%	59%	64%	70%	76%	81%	87%	93%	98%	104%	110%	115%

XP17-030 (2.5 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	42%	47%	52%	56%	61%	65%	70%	75%	79%	84%	88%	93%	98%	102%	107%	111%
2	39%	44%	49%	54%	59%	64%	69%	74%	79%	84%	89%	94%	99%	103%	108%	113%
3	35%	40%	45%	50%	56%	61%	66%	71%	76%	81%	86%	92%	97%	102%	107%	112%
4	30%	34%	38%	42%	46%	49%	53%	57%	61%	65%	68%	72%	76%	80%	83%	87%
5 (includes Canada ²)	28%	31%	34%	37%	40%	43%	46%	49%	52%	55%	58%	61%	64%	67%	70%	73%
6	27%	33%	38%	44%	49%	55%	60%	66%	72%	77%	83%	88%	94%	99%	105%	110%

XP17-036 (3 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	40%	44%	48%	52%	56%	59%	63%	67%	71%	75%	79%	83%	87%	91%	95%	99%
2	38%	42%	46%	51%	55%	60%	64%	68%	73%	77%	81%	86%	90%	94%	99%	103%
3	35%	40%	44%	49%	54%	59%	63%	68%	73%	78%	82%	87%	92%	97%	101%	106%
4	31%	35%	39%	42%	46%	49%	53%	57%	60%	64%	68%	71%	75%	78%	82%	86%
5 (includes Canada ²)	30%	32%	35%	38%	41%	44%	47%	50%	53%	56%	59%	61%	64%	67%	70%	73%
6	29%	34%	39%	45%	50%	56%	61%	67%	72%	77%	83%	88%	94%	99%	104%	110%

XP17-042 (3.5 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	39%	43%	47%	51%	55%	58%	62%	66%	70%	74%	78%	82%	86%	90%	93%	97%
2	39%	43%	47%	51%	55%	58%	62%	66%	70%	74%	78%	82%	86%	90%	93%	97%
3	36%	40%	45%	49%	53%	58%	62%	67%	71%	75%	80%	84%	89%	93%	97%	102%
4	32%	36%	39%	43%	46%	49%	53%	56%	60%	63%	67%	70%	74%	77%	80%	84%
5 (includes Canada ²)	30%	33%	36%	38%	41%	44%	47%	50%	53%	56%	58%	61%	64%	67%	70%	73%
6	29%	34%	40%	45%	50%	56%	61%	66%	71%	77%	82%	87%	93%	98%	103%	109%

XP17-048 (4 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	36%	39%	42%	45%	48%	51%	54%	57%	60%	63%	66%	69%	72%	75%	78%	81%
2	35%	38%	42%	45%	49%	52%	56%	59%	63%	66%	70%	73%	77%	80%	84%	87%
3	33%	37%	41%	45%	49%	53%	57%	61%	65%	69%	73%	77%	82%	86%	90%	94%
4	30%	33%	36%	40%	43%	46%	49%	53%	56%	59%	63%	66%	69%	73%	76%	79%
5 (includes Canada ²)	28%	31%	33%	36%	39%	42%	45%	47%	50%	53%	56%	58%	61%	64%	67%	70%
6	27%	32%	38%	43%	48%	53%	58%	64%	69%	74%	79%	84%	90%	95%	100%	105%

XP17-060 (5 TON) AIR CONDITIONER

Region	Number of Solar Modules (275W)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	39%	41%	44%	46%	49%	51%	54%	56%	59%	61%	64%	66%	69%	71%	74%	76%
2	37%	40%	43%	46%	49%	52%	55%	58%	61%	64%	67%	70%	73%	76%	79%	82%
3	35%	39%	42%	46%	49%	53%	56%	60%	64%	67%	71%	74%	78%	82%	85%	89%
4	31%	34%	37%	41%	44%	47%	50%	53%	56%	59%	62%	65%	68%	71%	74%	77%
5 (includes Canada ²)	29%	31%	34%	37%	40%	42%	45%	48%	50%	53%	56%	58%	61%	64%	66%	69%
6	28%	33%	38%	43%	48%	53%	58%	63%	68%	73%	78%	83%	88%	93%	98%	103%

LENNOX® SOLAR SUB-PANEL

NOTE

The Lennox® Solar Sub-Panel for the outdoor unit must be ordered separately. See below for ordering information.



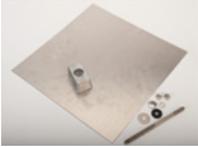
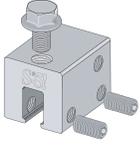
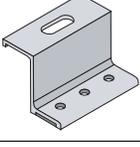
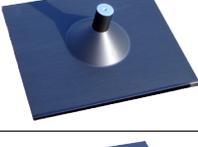
Order one per outdoor unit. Replaces the outdoor unit piping panel and provides the connection between the solar modules and outdoor unit.

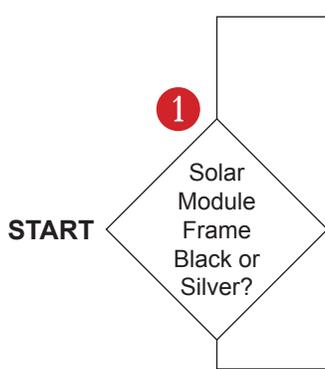
62E02

SOLARWORLD® PRE-ENGINEERED KITS - COMPONENTS

Description	Number of Modules	No. of Components in Kit				
		4	6	8	12	16
Solar Modules, Enphase Microinverter and Monitoring Components						
 Solar Module 275W (Silver) or 270W (Black) Mono		4	6	8	12	16
 Enphase Microinverter (M250)		4	6	8	12	16
 Enphase Envoy Communications Gateway (Communications Booster Furnished)		1	1	1	1	1
Enphase Engage Cable						
 Enphase Engage Cable, 240V Trunk Cable Port, portrait aligned (no. of connectors)		4	7	9	14	18
 Enphase Engage Cable Terminator		1	1	1	1	1
 Enphase Engage Disconnect Tool		1	1	1	1	1
 Enphase Engage Water-tight Sealing Cap		---	1	1	2	2
Enphase Microinverter Mounting Components						
 L-Bracket for microinverter, 100 mm, clear anodized aluminum, adjustment slots and serrated mating surfaces		4	6	8	12	16
 Flange Nut, 5/16"-16 serrated edge, 18-8 stainless steel		5	7	9	13	18
 Truss Screw, HD, 5/16"-18 x 0.75", 18-8 stainless steel		5	7	9	13	18

SOLARWORLD® PRE-ENGINEERED KITS - COMPONENTS

Description	Number of Modules	No. of Components in Kit				
		4	6	8	12	16
Roof Mounting Components						
	Composition Shingle Roof Mount Mount/Flashing with base block, hanger bolt and hardware, 12" x 12" (305 x 305 mm), Black or Silver	8	12	16	24	32
	Standing Seam Roof Mount, S-5!® S-5-U M8	8	12	16	24	32
	Trapezoid Metal Roof Mount, S-5!® VersaBracket	8	12	16	24	32
	Flat Tile Roof Mount, 18" x 18", Quick Mount PV QBase Universal Tile, Black or Silver	8	12	16	24	32
	S Tile Roof Mount, 18" x 18", Quick Mount PV QBase, Black or Silver	8	12	16	24	32
	Rail, two modules, 122 in. (3099 mm) length	---	4	---	---	---
	Rail, three modules, 162 in. (4115 mm) length	2	---	4	6	8
	Rail Splice Bar Connector	---	---	2	4	4
	Top Clamp Assembly (M8 bolt with channel nut and bolt positioning retainer), 1-1/4 in. (31 mm), silver or black	14	20	24	34	48
	End Clamp Aluminum Spacer, 1-1/4 in. (31 mm), silver or black	6	10	10	14	20
	Flange Nut, M8, serrated edge, stainless steel	16	22	28	40	56
	T-Bolt M8 x 20, stainless steel	13	19	25	37	50



BLACK FRAME

NOTE - Order Solar Modules, Microinverters and Balance of System Separately

Solar Modules (Quantity)	Enphase Microinverters (Quantity)	Balance of System
(4) 11G04	→ (4) 11F80	→ (1) 10J08
(6) 11G04	→ (6) 11F80	→ (1) 10J16
(8) 11G04	→ (8) 11F80	→ (1) 10J17
(12) 11G04	→ (12) 11F80	→ (1) 10J19
(16) 11G04	→ (16) 11F80	→ (1) 10J20

SILVER FRAME

NOTE - Order Solar Modules, Microinverters and Balance of System Separately

Solar Modules (Quantity)	Enphase Microinverters (Quantity)	Balance of System
(4) 11G01	→ (4) 11F80	→ (1) 10K31
(6) 11G01	→ (6) 11F80	→ (1) 10K32
(8) 11G01	→ (8) 11F80	→ (1) 10K33
(12) 11G01	→ (12) 11F80	→ (1) 10K34
(16) 11G01	→ (16) 11F80	→ (1) 10K38

2

ROOF MOUNT TYPE

NOTE - Order TWICE the amount of Roof Mounts as Solar Modules!

Composition Shingle, Black
Composition Shingle, Silver
Standing Seam Roof, S-5!® S-5-U M8
Trapezoid Metal Roof, S-5!® VersaBracket
Flat Tile Roof, Black
Flat Tile Roof, Silver
S Tile Roof, Black
S Tile Roof, Silver

NOTE - Balance of System DOES NOT contain the Solar Modules or Microinverter!
 Balance of System **DOES** contain the appropriate number of required Rails, Cables, Splices, Brackets, Clamps for the Solar Module installation. See next page for Pre-Engineered Kits Components list.
 Individual components **CANNOT** be ordered separately!

WORKSHEET

Job: _____	System Designation: _____
Location: _____	Architect: _____
Engineer: _____	Date: _____
Schedule No.: _____	For: Reference Approval

1 **SOLAR MODULES**

Solar Modules (Black): 11G04 Qty. _____

Solar Modules (Silver): 11G01 Qty. _____

Microinverters: 11F80 Qty. _____

Installation Package: Catalog No. _____ Qty. 1

2 **ROOF MOUNT TYPE?**

NOTE - Order TWICE the amount of Roof Mounts as Solar Modules!

Composition, Black: 10K40 Qty. _____

Composition, Silver: 10K39 Qty. _____

Standing Seam, S-5!® S-5-U: 10J43 Qty. _____

Trapezoid Metal, S-5!® VersaBracket: 10J44 Qty. _____

Flat Tile, Black: 10K45 Qty. _____

Flat Tile, Silver: 10K43 Qty. _____

S Tile, Black: 10J46 Qty. _____

S Tile, Silver: 10J45 Qty. _____

3 **SOLADECK JBOX**

Composition/Standing Seam/Metal
Flat Tile/S Tile Roof: _____

4 **INCLUDE ENPHASE ENVOY COMBINATION**

Yes _____

No _____

5 **INCLUDE WEEB DPF'S FOR SOLAR**

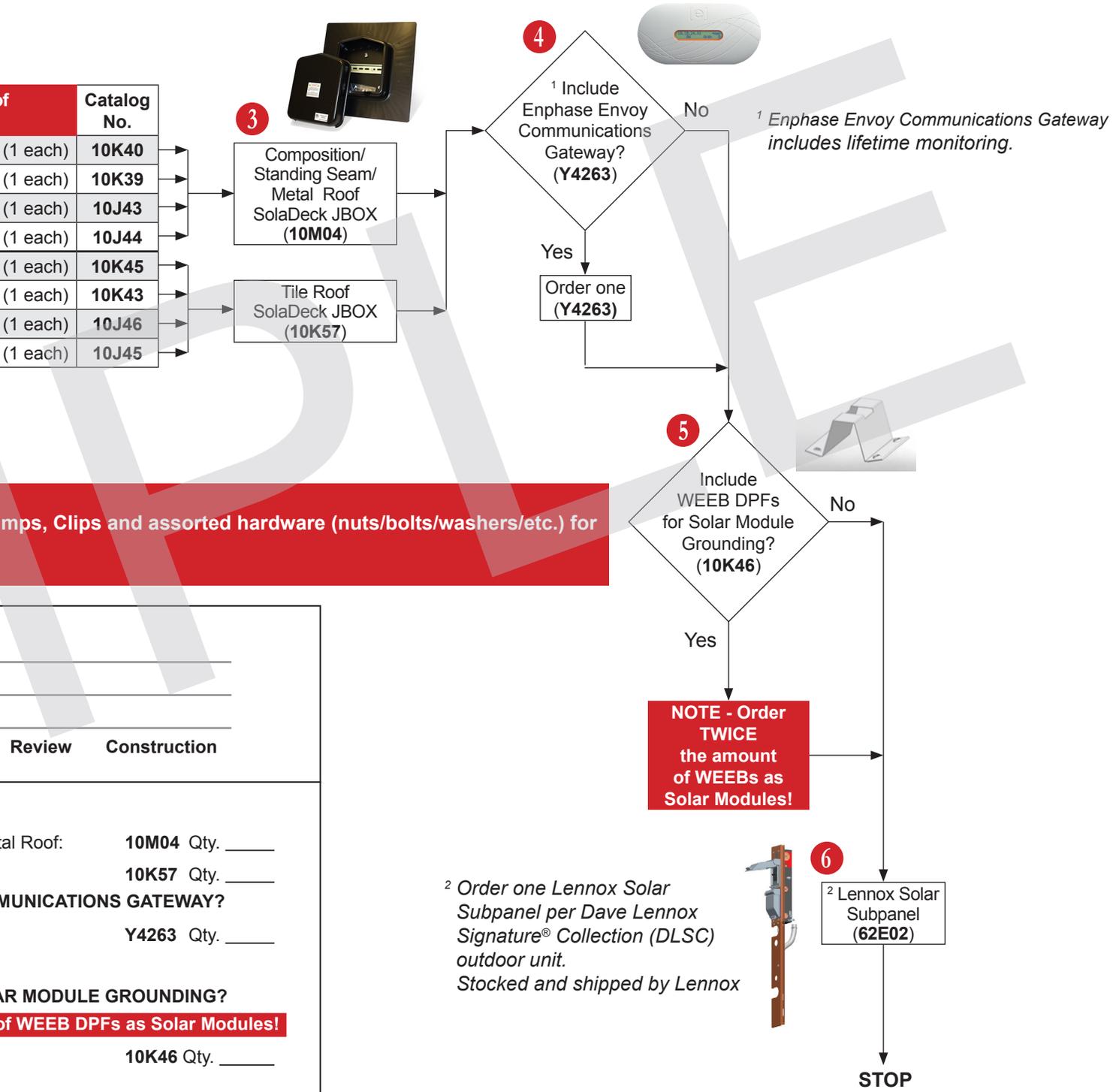
NOTE - Order TWICE the amount of

Yes _____

No _____

6 **LENNOX SOLAR SUBPANEL FOR**

**NOTE - See Bulletin No. 210680
 "SunSource® Home Energy System - Order Form/Worksheet"
 for Interactive Order Form/Worksheet.**



Qty	Catalog No.
(1 each)	10K40
(1 each)	10K39
(1 each)	10J43
(1 each)	10J44
(1 each)	10K45
(1 each)	10K43
(1 each)	10J46
(1 each)	10J45

WEEBs, Clips and assorted hardware (nuts/bolts/washers/etc.) for

Review	Construction
al Roof:	10M04 Qty. _____
	10K57 Qty. _____
MUNICATIONS GATEWAY?	Y4263 Qty. _____
AR MODULE GROUNDING?	
of WEEB DPFs as Solar Modules!	10K46 Qty. _____
DLSC OUTDOOR UNIT	62E02 Qty. _____

NOTE - Custom Engineered kits (ground mount, unique roofs, unique quantities, pole mount, car ports, etc.) must be ordered separately by registering on the SolarWorld site at <http://www.solarworld-usa.com/installer-program.aspx> and filling out the Location Questionnaire (also found on DaveNet).

SOLARWORLD® PRE-ENGINEERED KITS - COMPONENTS

Description	Number of Modules	No. of Components in Kit				
		4	6	8	12	16
Roof Mounting Components (Continued)						
	L-Bracket, clear anodized aluminum	8	12	16	24	32
	Wire Clip, 10AWG, 50-pack	1	1	1	1	1
	Cable Ties, 13", UV resistant, black, 50-pack	1	1	1	1	1
	Ground Lug, WEEB 8.0, tin plated, lay-in	5	7	9	13	18
	Ground Screw, 10-pack	1	1	1	2	2
	Rail-equipment Ground WEEB-lug 8.0 with T-bolt assembly	3	5	5	7	10
	WEEB DPF Module Grounding Clip.	8	12	16	24	32
	Rail splice ground jumper WEEB 8.0 pre-assembled with T-bolts	---	---	3	5	8
	Hex Bit, T40-2", 1/4" shank	1	1	1	1	1
	Rooftop Junction Box, Soladeck JBOX, Composition with flashing or Flat Tile/S Tile	1	1	1	1	1
	Soladeck 1 Branch or 2 Branch AC Passthru Kit, used with Rooftop Junction Box (no. of branches)	1 (1)	1 (1)	1 (1)	1 (1)	1 (2)

NOTE - Additional items not included that may be required for installation:

Lightning arrestors, array marking, or site specific system detail plaques, conduit, conduit fittings, ground/bonding conductor, AC disconnect switch, roof sealant.

RAIL SPAN INFORMATION

The following Rail Span Tables have been engineered to provide the maximum rail attachment span distance (values in inches) for Sunfix plus2 rails.

To effectively use the rail span tables, one should consider the wind and snow loads at the site by consulting the local building department. Span calculations utilized design methods or material data from ASCE 7-05, 2009 IBC, 2010 California Building Code, 2005 Aluminum Design Manual: specifications and Guidelines for Aluminum Structures, and 2005 National Design specification for Wood Construction.

The following assumptions are made:

- Seismic soil Site Class: D
- Seismic Design Category: E
- Ground Snow Loads: 0, 10, 20, 40, 50 lb./ft.2
- Wind Exposure: B&C, Roof Wind Zones 1, 2, 3
- Wind Speeds (3-second gust): 85, 90, 100, 110, 120, 130, 140, 150, 160, 170 mph
- Roof Slopes: 7 to 27° and 27 to 45°

Wind Exposure Category: ASCE 7-05 defines wind exposure categories as follows:

Exposure B: is an urban or suburban area, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single family dwellings upwind for at least a ½ mile.

Exposure C: has open terrain with scattered obstructions having heights generally less than 30 feet. This category includes flat open country, grasslands, and all water surfaces in hurricane prone regions.

Footnotes:

1. Tables depict maximum allowable span between supports based on rail allowable bending stress.
2. For additional limiting factors reference the deflection and attachment table.
3. Design reference ASCE 7-05 – 6.4.1.2 components and cladding, Method 1.
4. Mean roof height not greater than 60 feet.
5. Enclosed building conforming to wind-borne debris provisions.
6. Building not subject to cross wind loading, vortex shedding, or instability due to galloping or flutter.
7. Building location not subject to channeling effects or buffeting in the wake or upwind obstructions.
8. Building has gable roof with pitch not greater than 45 degrees, or hip roof with pitch not greater than 27 degrees.
9. For hip roofs with pitch not greater than 25 degrees, Zone 3 shall be treated as Zone 2.

RAIL SPAN INFORMATION - 7 TO 27 DEGREES

SUNFIX PLUS2 RAIL, WIND EXPOSURE B OR C, 1-SPAN CONDITION

Wind Speed	Zone	Rail Span/ Rail Cantilever	Roof Snow Load (lb./ft. ²)				
			0	10	20	40	50
85 mph	1	Rail Span (in.)	81	78	63	54	48
		Rail Cantilever (in.)	39	39	30	27	24
	2	Rail Span (in.)	66	66	63	54	48
		Rail Cantilever (in.)	33	33	30	27	24
	3	Rail Span (in.)	54	54	54	54	48
		Rail Cantilever (in.)	27	27	27	27	24
90 mph	1	Rail Span (in.)	75	75	60	54	48
		Rail Cantilever (in.)	36	36	30	27	24
	2	Rail Span (in.)	63	63	63	54	48
		Rail Cantilever (in.)	30	30	30	27	24
	3	Rail Span (in.)	51	51	51	51	51
		Rail Cantilever (in.)	24	24	24	24	24
100 mph	1	Rail Span (in.)	69	69	60	51	48
		Rail Cantilever (in.)	33	33	30	24	24
	2	Rail Span (in.)	57	57	57	51	48
		Rail Cantilever (in.)	27	27	27	24	24
	3	Rail Span (in.)	48	48	48	48	48
		Rail Cantilever (in.)	24	24	24	24	24
110 mph	1	Rail Span (in.)	63	63	57	51	45
		Rail Cantilever (in.)	30	30	27	24	21
	2	Rail Span (in.)	51	51	51	51	45
		Rail Cantilever (in.)	24	24	24	24	21
	3	Rail Span (in.)	42	42	42	42	42
		Rail Cantilever (in.)	21	21	21	21	21
120 mph	1	Rail Span (in.)	57	57	54	48	45
		Rail Cantilever (in.)	27	27	27	24	21
	2	Rail Span (in.)	45	45	45	45	45
		Rail Cantilever (in.)	21	21	21	21	21
	3	Rail Span (in.)	39	39	39	39	39
		Rail Cantilever (in.)	18	18	18	18	18
130 mph	1	Rail Span (in.)	51	51	51	48	45
		Rail Cantilever (in.)	24	24	24	24	21
	2	Rail Span (in.)	42	42	42	42	42
		Rail Cantilever (in.)	21	21	21	21	21
	3	Rail Span (in.)	36	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18
140 mph	1	Rail Span (in.)	48	48	48	45	42
		Rail Cantilever (in.)	24	24	24	21	21
	2	Rail Span (in.)	39	39	39	39	39
		Rail Cantilever (in.)	18	18	18	18	18
	3	Rail Span (in.)	42	42	42	42	42
		Rail Cantilever (in.)	15	15	15	15	15
150 mph	1	Rail Span (in.)	45	45	45	45	42
		Rail Cantilever (in.)	21	21	21	21	21
	2	Rail Span (in.)	45	45	45	45	45
		Rail Cantilever (in.)	18	18	18	18	18
	3	Rail Span (in.)	30	30	30	30	30
		Rail Cantilever (in.)	15	15	15	15	15
160 mph	1	Rail Span (in.)	42	42	42	42	39
		Rail Cantilever (in.)	21	21	21	21	18
	2	Rail Span (in.)	33	33	33	33	33
		Rail Cantilever (in.)	15	15	15	15	15
	3	Rail Span (in.)	27	27	27	27	27
		Rail Cantilever (in.)	12	12	12	12	12
170 mph	1	Rail Span (in.)	39	39	39	39	39
		Rail Cantilever (in.)	18	18	18	18	18
	2	Rail Span (in.)	33	33	33	33	33
		Rail Cantilever (in.)	15	15	15	15	15
	3	Rail Span (in.)	27	27	27	27	27
		Rail Cantilever (in.)	12	12	12	12	12

CONTINUED ON NEXT PAGE

RAIL SPAN INFORMATION - 27 TO 45 DEGREES

SUNFIX PLUS2 RAIL, WIND EXPOSURE B OR C, 1-SPAN CONDITION

Wind Speed	Zone	Rail Span/ Rail Cantilever	Roof Snow Load (lb./ft. ²)				
			0	10	20	40	50
85 mph	1	Rail Span (in.)	69	66	63	51	48
		Rail Cantilever (in.)	33	33	30	24	24
	2	Rail Span (in.)	72	66	63	51	48
		Rail Cantilever (in.)	36	33	30	24	24
	3	Rail Span (in.)	72	66	63	51	48
		Rail Cantilever (in.)	36	33	30	24	24
90 mph	1	Rail Span (in.)	66	63	60	51	48
		Rail Cantilever (in.)	33	30	30	24	24
	2	Rail Span (in.)	66	63	60	51	48
		Rail Cantilever (in.)	33	30	30	24	24
	3	Rail Span (in.)	66	63	60	51	48
		Rail Cantilever (in.)	33	30	30	24	24
100 mph	1	Rail Span (in.)	60	57	57	51	45
		Rail Cantilever (in.)	30	27	27	24	21
	2	Rail Span (in.)	60	60	57	51	45
		Rail Cantilever (in.)	30	30	27	24	21
	3	Rail Span (in.)	60	60	57	51	45
		Rail Cantilever (in.)	30	30	27	24	21
110 mph	1	Rail Span (in.)	57	54	51	51	45
		Rail Cantilever (in.)	27	27	24	24	21
	2	Rail Span (in.)	57	54	54	51	45
		Rail Cantilever (in.)	27	27	27	24	21
	3	Rail Span (in.)	57	54	54	51	45
		Rail Cantilever (in.)	27	27	27	24	21
120 mph	1	Rail Span (in.)	51	48	48	48	45
		Rail Cantilever (in.)	24	24	24	24	21
	2	Rail Span (in.)	51	51	48	48	45
		Rail Cantilever (in.)	24	24	24	24	21
	3	Rail Span (in.)	51	51	48	48	45
		Rail Cantilever (in.)	24	24	24	24	21
130 mph	1	Rail Span (in.)	48	45	45	45	42
		Rail Cantilever (in.)	24	21	21	21	21
	2	Rail Span (in.)	48	48	45	45	42
		Rail Cantilever (in.)	24	24	21	21	21
	3	Rail Span (in.)	48	48	45	45	42
		Rail Cantilever (in.)	24	24	21	21	21
140 mph	1	Rail Span (in.)	45	42	42	42	39
		Rail Cantilever (in.)	21	21	21	21	18
	2	Rail Span (in.)	45	45	42	42	42
		Rail Cantilever (in.)	21	21	21	21	21
	3	Rail Span (in.)	45	45	42	42	42
		Rail Cantilever (in.)	21	21	21	21	21
150 mph	1	Rail Span (in.)	42	39	39	39	39
		Rail Cantilever (in.)	21	18	18	18	18
	2	Rail Span (in.)	42	42	39	39	39
		Rail Cantilever (in.)	21	21	18	18	18
	3	Rail Span (in.)	42	42	39	39	39
		Rail Cantilever (in.)	21	21	18	18	18
160 mph	1	Rail Span (in.)	39	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18
	2	Rail Span (in.)	36	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18
	3	Rail Span (in.)	36	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18
170 mph	1	Rail Span (in.)	36	36	36	42	33
		Rail Cantilever (in.)	18	18	18	21	15
	2	Rail Span (in.)	36	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18
	3	Rail Span (in.)	36	36	36	36	36
		Rail Cantilever (in.)	18	18	18	18	18

SOLAR MODULE SPECIFICATIONS

PERFORMANCE

		Black Solar Module (270 Wp)		Silver Solar Module (275 Wp)	
		¹ Performance Under Standard Testing Conditions	² Performance At 800 W/m ² , Normal Operating Cell Temperature (NOCT), AM 1.5	¹ Performance Under Standard Testing Conditions	² Performance At 800 W/m ² , Normal Operating Cell Temperature (NOCT), AM 1.5
Maximum Power	P _{max}	270 Wp	199.4 Wp	275 Wp	205 Wp
Open Circuit Voltage	V _{oc}	39.2V	35.5V	39.4V	36.1V
Maximum Power Point Voltage	V _{mpp}	30.9V	28.0V	31.0V	28.4V
Short Circuit Current	I _{sc}	9.44A	7.63A	9.58A	7.75A
Maximum Power Point Current	I _{mpp}	8.81A	7.12A	8.94A	7.22A

¹ Standard Testing Conditions at 1000W/m², 25°C, AM 1.5

² Minor reduction in efficiency under partial load conditions at 25°C: at 200W/m², 95% (+/-3%) of the STC efficiency (1000 W/m²) is achieved.

COMPONENT MATERIALS

	270 Wp	275 Wp
Cells per module	60	60
Cell type	Mono crystalline	Mono crystalline
Cell dimensions	6.14 in. x 6.14 in.	6.14 in. x 6.14 in.
Front	Tempered glass (EN 12150)	Tempered glass (EN 12150)
Frame	Black anodized aluminum	Clear anodized aluminum
Weight	47 lbs.	47 lbs.

SYSTEM INTEGRATION PARAMETERS

Maximum system voltage SC II	1000V	
Maximum system voltage USA NEC	600V	
Maximum reverse currents	16A	
Number of bypass diodes	3	
UL Design Loads	Two rail system	113 psf downward, 64 psf upward
UL Design Loads	Three rail system	170 psf downward, 64 psf upward
IEC Design Loads	Two rail system	113 psf downward, 50 psf upward

THERMAL CHARACTERISTICS

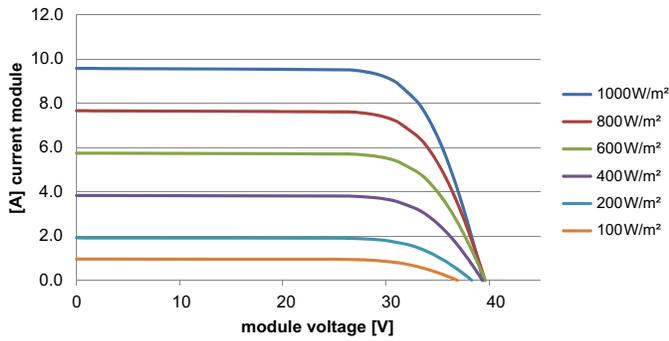
	270 Wp	275 Wp
NOCT	118°F	115°F
TCI _{sc}	0.04%/K	0.04%/K
TC _{voc}	-0.30%/K	-0.30%/K
TCP _{MPP}	-0.45%/K	-0.45%/K
Operating Temp.	-40°F to 185°F	-40°F to 185°F

ADDITIONAL DATA

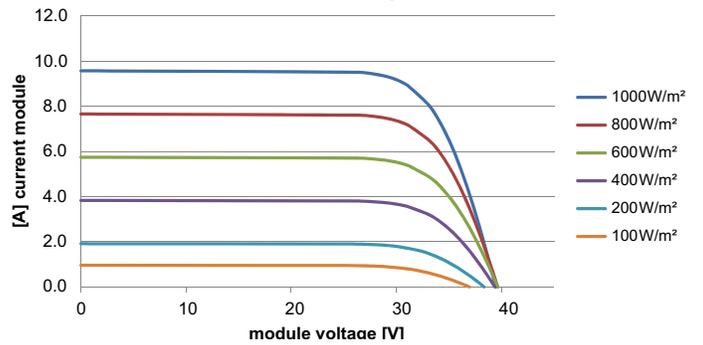
	270 Wp	275 Wp
Power Sorting	-0 Wp / +5 Wp	-0 Wp / +5 Wp
J-Box	IP65	IP65
Connector	MC4 / KSK4	MC4
Module Leads	PV wire per UL4703 with H4 connectors	
Module efficiency	16.10%	16.40%
Fire rating UL (790)	Class C	Class C

SOLAR MODULE PERFORMANCE CHARACTERISTICS

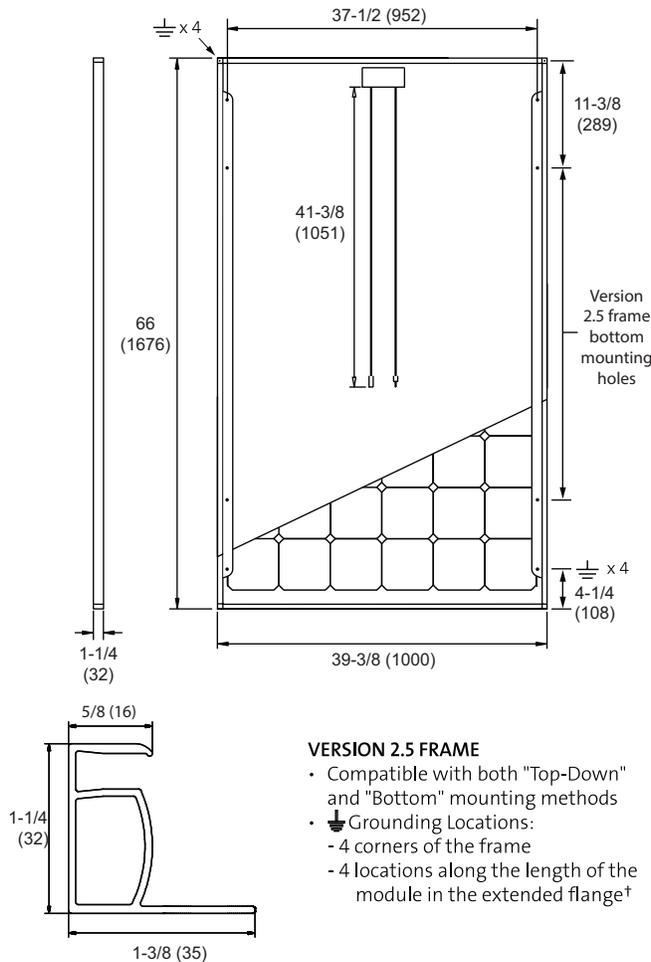
IV-curves for SolarWorld Sunmodule Plus SW 270 mono black at 25°C cell temperature

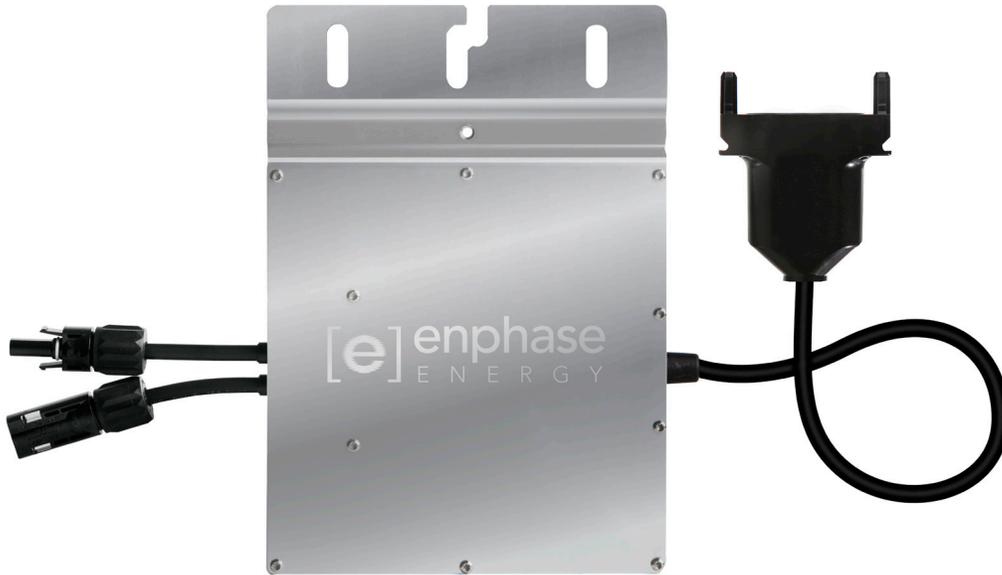


IV-curves for SolarWorld Sunmodule Plus SW 275 mono at 25°C cell temperature



DIMENSIONS - INCHES (MM)





How the Enphase Microinverter Works

The Enphase Microinverter maximizes energy production from the solar module array. Each Enphase Microinverter is individually installed on one solar module in the array.

This unique configuration means that an individual Maximum Peak Power Point Tracker (MPPT) controls each solar module. This ensures that the maximum power available from each solar module is exported to the utility grid regardless of the performance of the other solar modules in the array.

Even if individual solar modules in the array are affected by shading, soiling or orientation, the Enphase Microinverter ensures optimum performance for each associated solar module. The result is maximum energy production from the SunSource® Energy System.

Enphase Microinverter Status LED Indications and Error Reporting

Startup LED Operation:

Six short green blinks when DC power is first applied to the Enphase Microinverter indicates a successful microinverter startup sequence.

Six short red blinks when DC power is first applied to the Enphase Microinverter indicates a failure during microinverter startup.

Post-Startup LED Operations:

Flashing Green - Producing power and communicating with Envoy

Flashing Orange - Producing power and not communicating with Envoy

Flashing Red - Not producing power

GFDI Fault:

A solid red status LED when DC power has been cycled, indicates the Enphase Microinverter has detected a ground fault (GFDI) error. The LED will remain red and the fault will continue to be reported by the Envoy until the error has been cleared. The error can only be cleared via the Envoy after the ground fault condition has been remedied.

Other Faults:

All other faults are reported to the Envoy.

ENPHASE MICROINVERTER OPERATING PARAMETERS

INPUT DATA (DC)

Recommended Input Power (STC)	210 - 300W
Maximum Input DC Voltage	48V
Peak Power Tracking Voltage	22V - 39V
Operating Range	16V - 48V
Min./Max Start Voltage	22V / 48V
Max. DC Short Circuit Current	15A
Max. Input Current	9.8A

OUTPUT DATA (AC)

	208 VAC	240 VAC
Maximum Output Power	250W	250W
Nominal Output Current	240W	240W
Nominal Voltage / Range	1.15A (A _{RMS} at nominal duration)	1.0A (A _{RMS} at nominal duration)
Extended Voltage / Range	208V / 183 - 229V	240V / 211 - 264V
Nominal Frequency / Range	N/A	N/A
Extended Frequency / Range	60.0 / 57 - 61 Hz	60.0 / 57 - 61 Hz
Power Factor	57 - 62.5 Hz	57 - 62.5 Hz
Maximum Units Per 20A Branch Circuit	>0.95	>0.95
Maximum Output Fault Current	850 mA _{RMS} for 6 cycles	

EFFICIENCY

CEC Weighted Efficiency	96.5%
Peak Inverter Efficiency	96.0%
Static MPPT Efficiency (weighted, reference EN50530)	96.5%
Night Time Power Consumption	65mW max

MECHANICAL DATA

Ambient Temperature Range	-40°F to 149°F
Operating Temperature Range (Internal)	-40°F to 185°F
Dimensions (W x H x D)	6.8 in. x 6.45 in. x 1 in.
Weight	4.5 lbs.
Cooling	Natural Convection - No Fans
Enclosure Environmental Rating	Outdoor - NEMA 6

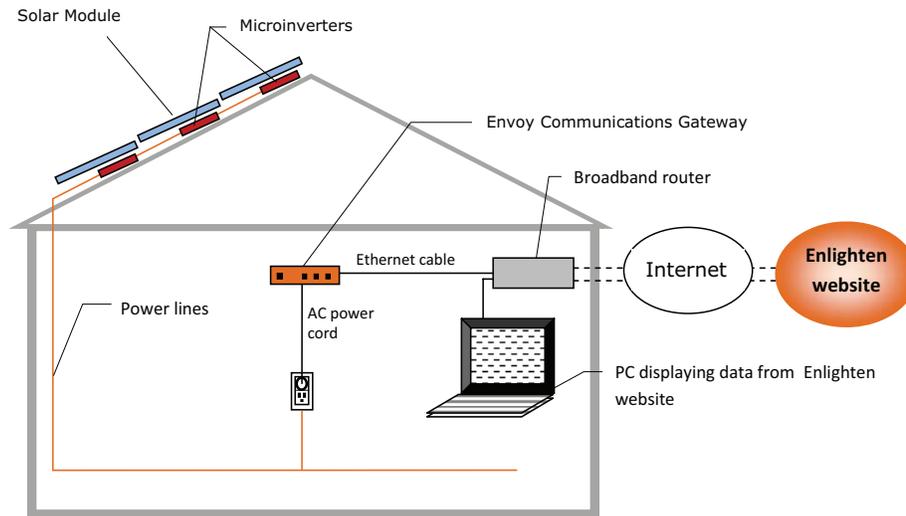
FEATURES

Compatibility	Pairs with most 60-cell PV Solar Modules
Communication	Power Line
Warranty	25-year Limited Warranty
Monitoring	Free Lifetime Monitoring via Enlighten Software
Compliance	UL1741/IEEE1547, FCC Part 15 Class B CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01

VOLTAGE AND FREQUENCY LIMITS FOR UTILITY INTERACTION

Condition	Simulated utility source		Maximum time (sec) (cycles) at 60 Hz before cessation of current to the simulated utility
	Voltage (V)	Frequency (Hz)	
A	$< 0.50 V_{\text{Typical}}$	Rated	0.16
B	$0.50 V_{\text{Typical}} \leq V < 0.88 V_{\text{Typical}}$	Rated	2
C	$1.10 V_{\text{Typical}} < V < 1.20 V_{\text{Typical}}$	Rated	1
D	$1.20 V_{\text{Typical}} \leq V$	Rated	0.16
E	Rated	$f > 60.5$	0.16
F	Rated	$f < (59.8 - 57.0)$	0.16 - 300
G	Rated	$f < 57.0$	0.16

ENPHASE ENVOY COMMUNICATIONS GATEWAY



The Enphase Envoy Communications Gateway is an integral component of the SunSource® Home Energy System. It operates between the microinverters on the Solar Modules and the Enphase Enlighten™ Performance Monitoring website and analysis system. The Envoy functions as a gateway and monitors the microinverters that are connected to the modules.

The Envoy collects energy and performance data from the microinverters over existing home AC power wiring. It then forwards that data to the Enphase Enlighten™ web-based monitoring and analysis, via the Internet, for statistical reporting.

The microinverter system is a fully integrated device that converts the DC output of a single Solar Module into grid-compliant AC power. In addition to performing the DC to AC conversion, it maximizes the modules' energy production by utilizing a sophisticated Maximum Power Point Tracking (MPPT) algorithm. This integrated system maximizes energy harvest, increases system reliability, and simplifies design, installation and management.

The Enphase Enlighten™ web-based monitoring and analysis system analyzes the per-module data collected by each microinverter. Enlighten automatically detects any shortfall in energy production, identifies possible causes, and suggests solutions to correct the problem. The Enphase Enlighten website is constantly monitoring every module on every installation.

Installation and operation of the Envoy requires no special computer or networking knowledge, nor any specialized equipment. It simply plugs into a broadband Internet router for communications with the Enphase Enlighten™ monitoring and analysis website. The Envoy communicates with the individual microinverters over the existing power wires in the residence or business.

After the Envoy is installed, no additional configuration is required.

After the Envoy is installed and completes its initial scan, it assembles an internal database of all known Enphase microinverters at the site it manages. At regular intervals, the Envoy polls each microinverter for its energy data. Using the site's Broadband router, the

Envoy then forwards that information on to the Enphase Enlighten™ monitoring and analysis website. The Envoy also reports any error conditions that affect itself or the microinverters. You can view both energy data and error conditions at the Enphase Enlighten™ web-based monitoring and analysis system.

A Menu Button on the panel allows user to view system status on the LCD panel display and initiate scans and communication checking.

If there is no Internet access at the installation site, it is still possible to communicate directly with the Envoy using the Ethernet port and a personal computer with a web browser. Home Screen, Production Screen and Inventory Screen allow user to monitor the system. Event Messages are also displayed on the computer screen. See next page for a complete list of event messages.

SPECIFICATIONS

COMMUNICATIONS INTERFACE

Powerline	Enphase Proprietary
Ethernet	10/100 Auto-sensing, Auto-negotiation

POWER REQUIREMENTS

AC Outlet	120 VAC, 60 Hz
Power Consumption	2.5 Watts typical, 7 watts maximum

MECHANICAL DATA

Dimensions - in. (mm) (W x H x D)	8.8 x 4.4 x 1.7 (223 x 112 x 43)
Weight	12 oz.
Ambient Temperature Range	-40 to 149°F (-40 to +65°C)
Cooling	Natural Convection – no fans
Enclosure Environmental Rating	Indoor - NEMA 1

FEATURES

Standard Warranty	1 year
Compliance	UL 60950, EN 60950, FCC Part 15 Class B

ENPHASE ENVOY COMMUNICATIONS GATEWAY

Table lists messages that the Envoy can produce to indicate certain conditions. These messages appear on screen when your computer is connected to the Envoy local interface. These messages can provide Enphase Customer Support with information, should you need to call for assistance.

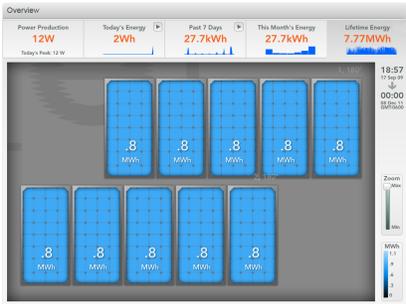
EVENT MESSAGES		
Home Screen	Inventory Screen	Description
AC Frequency Out Of Range	ac-freq-oor	The frequency of the AC grid has exceeded the limits specified by UL 1741.
AC Voltage Out Of Range	ac-voltage-oos-p# (# = 1, 2 or 3)	The voltage of the indicated AC phase (relative to neutral) has exceeded the limits specified by UL 1741.
Audible alarm active	audible-active	The inverter's buzzer is active, either due to an internally detected error or by user command.
Bad Flash Image	bad-flash-image	The inverter is not producing power because one of its flash memory images is corrupt. Contact Enphase Energy customer support at 877- 797-4743 for assistance.
Commanded Reset	commanded-reset	The inverter has reset, either following a successful image download or by user command.
Control Request		This event logs a user control request made using the Administration > Device Conditions and Controls page or via Enlighten.
Critical Temperature	critical-temp	The inverter is producing less power in an attempt to not overheat (see Over Temperature)
DC Too High	dc-voltage-hi	The DC input voltage to the inverter is too high; check that the PV module and inverter are compatible.
DC Too Low	dc-voltage-lo	The DC input voltage to the inverter is too low; this is a normal condition at night, but during the day may indicate a bad or missing DC connection to the inverter.
Download to module begun		The Envoy has begun an image download to the indicated inverter.
Download to module ended		The Envoy has successfully downloaded an image to an inverter.
Download to module failed		The Envoy was unable to successfully download an image to an inverter.
GFI Tripped	gfi-tripped	An inverter has detected ground fault current greater than one amp. The error can only be cleared via the Envoy after the ground fault condition has been remedied. The GFI can be cleared using the Device Conditions and Controls page unless the failure is permanent. Contact Enphase Energy customer support at 877- 797-4743 for assistance.
Grid Gone	grid-gone	The AC utility grid is no longer present.
Grid Instability	grid-instability	The inverter is not producing power due to one or more of these conditions: AC Frequency Out Of Range, AC Voltage Out Of Range, or Grid Gone. Note that Grid Instability will remain for about 5 minutes after the underlying conditions clear.
Module added		The Envoy has detected and is now associated to a new inverter.
Module failed to report		The Envoy has not received a response to the last three messages sent to an inverter.
Module Sleeping		Inverter is off for the night
Over Temperature	over-temp	The inverter is not producing power, because it is too hot.
Power generation off by command	forced-pwr-prod-off	The inverter is not producing power by user command.
Power On Reset	power-on-reset	The inverter has powered on after having both AC and DC disconnected.
Shutdown		The Envoy shut down its internal processing.
Skipped Cycles	skipped-cycles	The inverter has not produced power for more than 5% of the most recent production interval; this may be due to real problems in the grid, or a hardware failure of the inverter.
Startup		The Envoy started its internal processing.

PERFORMANCE - MONITORING WEBSITE

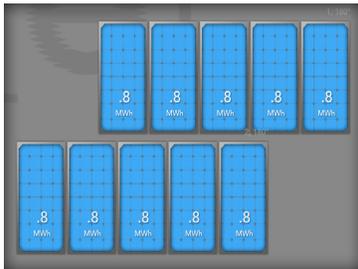
The performance-monitoring website delivers visible proof of the SunSource® Home Energy System's reliability, and allows the homeowner to better understand its operation. The homeowner can log onto the website any time to view an easy-to-interpret display of both real-time and past performance data and analysis.

*Free lifetime monitoring service.

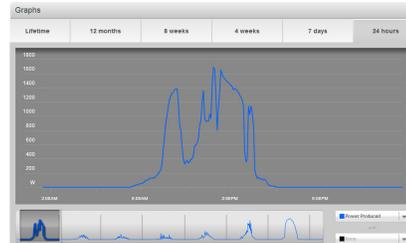
*Performance monitoring website provided by an independent third party, Enphase Energy, Inc.



The overview pane displays current system status, current energy production, the energy produced for the day, the month and the lifetime of the SunSource system.



This section of the screen displays an aerial view of the roof, showing how the solar modules are physically configured. The homeowner can view energy production information for each module on a current, daily, monthly and lifetime basis.



View time-lapse animation of the solar array (bottom of screen) to see how power generation is affected by the sun and obstructions such as shade trees or a nearby chimney.

Constant Monitoring And Analysis Ensures Reliability



The SunSource performance-monitoring website also analyzes production shortfalls, establishes a possible cause and suggests solutions to remedy the situation. Beyond monitoring and analysis, the website can even notify the homeowner and the installing contractor if a problem occurs. At the time of installation, the system can be instructed to send the homeowner—or the Dealer—an alert if a production issue or some other situation warrants attention.



The performance monitoring website also automatically calculates the environmental benefits provided by the SunSource Home Energy System.

HOME ENERGY SYSTEM CHECKLIST

Customer Name:

Date:

Customer Address:
(Street, City, State And Zip Code)

Electric Utility:

SECTION I – SITE AND CUSTOMER

<p>1. Does site have 240VAC split-phase power? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>The utility-interactive SunSource® Home Energy System is for split-phase power (typical residential service) and will only interconnect and supply power if the grid power meets the following specifications:</p> <ul style="list-style-type: none"> • L1 - L2 voltage measures between 211 Volts and 264 Volts • Line to neutral/ground voltage measures between 106 and 132 Volts • Frequency measures between 59.3 Hz and 60.5 Hz
<p>2. A. Does site have good southern exposure? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B. Is it free of shading? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Perform a solar site survey using a Solar Pathfinder™ or other survey tool to assess the solar resource available.</p> <p>Next, use the web-based program, PVWatts (ver. 1), from the National Renewable Energy Lab, to estimate the monthly and annual solar energy generation potential</p> <p>NOTE: For more information concerning Solar Pathfinder, see Lennox Corp 1021-L3, Application and Design Guidelines for more information</p>
<p>3. Is the roof suitable for mounting solar modules? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>1. Is there enough area for the solar modules? One solar module requires about 25 square feet.</p> <p>2. There are four different types of roof flashings to accommodate the more common styles of roofs. (Since the solar modules must be removed during a re-roof, it is best not to install the solar modules on a roof in poor condition. Take note of the pitch of the roof and the height of the eaves. OSHA has fall protection compliance guidelines. For example, see OSHA Directive STD 03-00-001.</p>
<p>4. Is the home's electrical distribution panel adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Generally, the distribution panel should be rated 75 to 100 AMP or more for one SunSource® Home Energy System installation. (For two systems, the panel should be 150 AMP or larger.) (See also Code Compliance section)</p>
<p>5. Will the solar modules be closer to HVAC (outdoor unit) or distribution panel? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>There are two different ways to wire-in the solar power system. This step in the planning phase helps determine which method will be faster and easier to use. If the HVAC outdoor unit is nearest to the solar modules it is probably easier to use the Lennox® Solar Subpanel and bring the solar power circuit to the unit. If the electrical distribution panel is closer to the solar modules than the outdoor unit, then it may be easier to bring the solar power circuit to the panel.</p>
<p>6. Check for ease of modifications to distribution panel. <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>If the solar power circuit connects to the HVAC outdoor unit, the HVAC branch circuit breaker (in the distribution panel) will need to be relocated to a slot that is at the opposite end from the main breaker. If the solar power circuit is run directly to the distribution panel, a new 20 AMP, 2-pole breaker will need to be installed in one of the slots that is at the opposite end from the main breaker. This step is to get an early view of issues such as no available slots or difficulty relocating the HVAC branch circuit breaker.</p> <p>In addition, the back feed breaker, whether it is the HVAC branch circuit breaker or a separate 20 AMP breaker, is suitable if it is a conventional breaker and the terminals are NOT marked Line and Load. It should not be a GFCI or arc-fault type circuit breaker.</p>
<p>7. Does the customer have an "always on" internet connection? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>An internet connection, with broadband router is required for the Enphase Envoy Communications Gateway to connect to the monitoring service. While use of the Envoy and the service are highly recommended, they are not required for the solar power system to operate.</p> <p>NOTE: There are some instances when the Communications Booster (furnished with Envoy Communications Gateway) may be required to insure reliable data communication.</p>
<p>8. Are there HOA restrictions? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Home Owners Associations (HOA) may require a plan to be submitted for approval.</p>

Continued on next page

HOME ENERGY SYSTEM CHECKLIST

SECTION II – INTERCONNECTION AND NET-METERING

9.	Does the electric utility have a net-metering program? <input type="checkbox"/> Yes <input type="checkbox"/> No	It is necessary to notify the electric utility of the customer's intention to install a utility-interactive solar power generation system. Most utilities are familiar with these systems and will already have a policy and rules for "net-metering".
10.	Does the electric utility have any special requirements? <input type="checkbox"/> Yes <input type="checkbox"/> No	Some utilities will require an indicating, lockable disconnect switch on the solar power system. If the utility has some form of incentive program, they may require the solar power system to be sub-metered. When the utility has requirements like this, they sometimes provide the required hardware.
11.	If there is an incentive program, is there a minimum kW threshold? <input type="checkbox"/> Yes <input type="checkbox"/> No	For example, some utilities require a 1kW and 2kW threshold for some rebate/incentive programs.
12.	Does customer understand this is not a grid independent system? <input type="checkbox"/> Yes <input type="checkbox"/> No	It is important to make sure the customer understands that this is a utility-interactive PV system and WILL NOT generate power when the grid is down. In addition the SunSource® Home Energy System will not produce power concurrently with a back-up generator.

SECTION III – CODE COMPLIANCE

13.	Have all the local electrical code requirements been identified? <input type="checkbox"/> Yes <input type="checkbox"/> No	<p>In almost all US jurisdictions, the National Electric Code (NEC) will be cited as the authority for electrical inspections and in Canada, it is the Canadian Electric Code (CE Code). There may be additional local requirements. NEC section 690 gives the requirements for solar PV installations. Wind load calculations are sometimes requested by code officials.</p> <p>If this is the first time to install a SunSource® Home Energy System in this jurisdiction, it is advisable to meet with the local inspection department to find out what requirements exist. This will save time in the long run since the permit submission package can address any special requirements.</p>
14.	Is grounding electrode required for the solar PV systems? <input type="checkbox"/> Yes <input type="checkbox"/> No	Solar PV AC modules are not required by the NEC to have a separate grounding electrode but the local jurisdiction may require one to be installed.

This checklist is to be used as an aid in assessing the conditions that prevail at a particular site. A "no" check-box answer does not necessarily mean a system cannot be installed. Rather it may indicate that there may be additional action needed – for example, additional electrical wiring.

NOTES:

REVISIONS

Sections	Description of Change
Estimated Annual Operating Costs Savings Tables	Updated to reflect new Solar Modules.
Microinverter	Updated to new M250 model.
Pre-Engineered Kits	Increased kit quantity from 16 modules to 20 modules and updated individual component quantities to match.
Solar Modules	Updated to new 275W models.



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