



# SOL-ARK 8K

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More Affordable: 5-15% less solar panels & 5-20% less batteries than others!

# World's Most Efficient Battery Inverter

Energy Insurance for your family



**S&P GLOBAL PLATTS** GLOBAL ENERGY AWARDS 2018 FINALIST





## Battery Solar made Affordable





Battery communication

### Battery Solar made Better

### GROUND BREAKING EFFICIENCY

Sol-Ark 8K is 96.5% Efficient



120/240V AC 3.5% Transformerless Conversion Loss

### POWERFUL

8,000W continuous for On Grid production & 20,000W peak Off Grid for starting 3 ton A/C or well pumps  $\diamond$ 

### FLEXIBLE

EMP

Grow as you go. Sol-Ark 8K works with 5-36 Solar panels (up to 11KW) and 0-32 Batteries  $\Diamond$ 

EMP/CME/LIGHTNING PROTECTION

Protect your system and appliances from EMP/Solar Flare/Lightning at 2X military requirements  $\diamond$ 

Brand & Model         Sol-Ark Sol-Ark Sol-Ark         Spikova Sol-Ark Sol-Ark Sol-Ark         Pika Sol-Ark Sol-Ark Sol-Ark Sol-Ark         Pika Sol-Ark Sol-Ark Sol-Ark Sol-Ark         Pika Sol-Ark Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark Sol-Ark         Sol-Ark Sol-Ark         Sol-Ark         Sol-Ark </th <th></th>											
Sol-Ark         Skybox         X7500         7600A         Dark         Radian         XW6848+         ECO-16         24/448PA         Powervall           Brand & Model         RK         SBX5048         4x52500         32,0P400         2xH5001         FPR-8048A         2xMPT80         +String Im         +16/KGT500         55,500         52,000         58,500			Outback	Pika	SolarEdge		Outback	Schneider	Sonnen	Magnum	Tesla 2x
Brand & Model Price         8K         SEX5048         4x52500         32xP400         2xH5001         FPR-8048A         2xMPPT80         + String Inv         +16xGT500         \$-50		Sol-Ark	Skybox	X7600 +	7600A +	Darfon	Radian	XW6848 +	ECO-16	2x4448PAE	Powerwall2
Price         56,500         56,500         56,500         55,500         59,000         \$8,500         528,500         512,000         522,000           Inverter Continous Power         SKW         SKW         7.6KW         88KW         528,500         88KW         22KSW           Off Grid Inverter Power peak (5)         SW         5KW         7.6KW         88KW         12KW         15K         12KW         14KW           AC to DC Charger         185A         Color         12K         12K         12K         14K         15K         12K         72K           PV to Batt Efficiency @655%         97.5%         92.0%         91.0%         92.5%         96.0%         82.0%         80.5%         95.5%         95.5%         96.5%         95.5%         91.0%         92.5%         93.0%         95.5%         92.5%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%	Brand & Model	8К	SBX5048	4xS2500	32xP400	2xH5001	FPR-8048A	2xMPPT80	+ String Inv	+16xGT500	+ String Inv
Inverter Continuos Power Off Grid Inverter Power peak [5] System Idle Power A C to D C Charger8KW5KW7.6KW (Batt $\pm$ 5KW)9.5KW12KW6.8KW12KW12KW12KW12KW14KWAC to D C Charger13K120W5KW12KW12KW12KW12KW12KW12KW14KWMuser Interface Color touch60W10W60K10W10K115A140A115A120AN/AUser Interface PV to Batt Efficiency @6558 Batt to A C Efficiency @6558 PV > Batt A C Efficiency @655897.5%92.0%91.0%91.0%97.5%96.0%82.0%80.0%85.0%91.5%85.0%80.5%95.5%95.0%On Grid PV to A C Efficiency @6558 PV > Batt > A C Losses @ 65996.5%95.5%96.5%95.5%96.5%95.5%90.2%88.5%97.0%95.5%97.0%Off Grid or Time of Use PV > Batt > A C Losses @ 6597%15%+15%+15%21%19%10%12%25%30%13%UPS Grid Failure Transfer Time Low Cost zay Install Warrany electronic S /10U P200ms200ms20ms10ms8ms16ms16ms26.0WhMC Cupling to Micro/String Inverter Parallel Stacking Warrany electronic S /10U P5/10U P <td>Price</td> <td>\$6,500</td> <td>\$6,000</td> <td>\$6,500</td> <td>\$5,500</td> <td>\$6,500</td> <td>\$9,000</td> <td>\$8,500</td> <td>\$28,500</td> <td>\$12,000</td> <td>\$29,000</td>	Price	\$6,500	\$6,000	\$6,500	\$5,500	\$6,500	\$9,000	\$8,500	\$28,500	\$12,000	\$29,000
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$					7.6KW						
Off Grid Inverter Power peak [5s]       20kW       5kW       12kW       6.6kW       13kW       12kW       12kW<	Inverter Continous Power	8KW	5KW	7.6KW	(Batt=5KW)	2x5.5KW	8KW	6.8KW	8KW	2x4KW	2x5KW
System Idle Power         60W         100W $\sim$ 200W         76W         48W         60W         58W         78W           A C to D C Charger         185A $\sim$ $6.7W$ $5.W$ 120A         115A         140A         115A         120A         N/A           User Interface         color touch         touch         Text         Text         Text         Text         Text         Text         touch         Text         100W         97.5%         96.0%         82.0%         80.5%         95.5%         95.5%         91.0%         91.0%         91.0%         95.5%         96.0%         82.0%         85.0%         95.5%         95.5%         90.0%         85.0%         91.0%         92.5%         91.0%         92.5%         93.0%         92.5%         93.0%         93.0%         92.5%         93.0%         93.0%         92.5%         95.5%         95.5%         90.2%         88.5%         97.0%         95.5%         95.5%         91.0%         92.5%         93.0%         93.0%         92.5%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0%         93.0% <td< td=""><td>Off Grid Inverter Power peak (5s)</td><td>20KW</td><td>5KW</td><td>12KW</td><td>6.6KW</td><td>13KW</td><td>12KW</td><td>12KW</td><td>12KW</td><td>17KW</td><td>14KW</td></td<>	Off Grid Inverter Power peak (5s)	20KW	5KW	12KW	6.6KW	13KW	12KW	12KW	12KW	17KW	14KW
AC to DC Charger       185A	System Idle Power	60W	100W			200W	76W	48W	60W	58W	78W
User Interface         Color         Color         Color         Color         Text         Text <td>AC to DC Charger</td> <td>185A</td> <td></td> <td>6.7KW</td> <td>5KW</td> <td>120A</td> <td>115A</td> <td>140A</td> <td>115A</td> <td>120A</td> <td>N/A</td>	AC to DC Charger	185A		6.7KW	5KW	120A	115A	140A	115A	120A	N/A
User Interface PV to Batt Efficiency @ 65% AC to Batt Efficiency @ 65% Batt to AC Efficiency @ 65%touchtouchTextStattPV to Batt Efficiency @ 65%96.0%93.0%91.0%91.0%91.0%91.0%91.0%92.5%93.0%91.0%95.0%95.0%93.0%92.5%93.0%95.0%			color						color		
PV to Batt Efficiency @ 65% AC to Batt Efficiency @ 65%97.5%92.0%91.0%97.5%96.0%82.0%80.5%92.5%Batt to AC Efficiency @ 65%95.5%93.0%93.0%93.0%93.0%93.0%93.0%93.0%93.0%93.0%95.5%95.5%On Grid PV to AC Efficiency @ 65%96.5%95.5%96.5%96.5%95.5%90.2%88.5%97.0%95.5%97.0%Off Grid or Time of Use PV -> Batt -> AC Losses @ 65%94.0%95.5%21%19%10%12%25%30%13%Battery Bark UPS Grid Failure Transfer Time Low Cost Easy Instal Warranty electronics26kWh20.0km20.0km20.0km20.0km20.0km26.0km26.0km26.0km16ms8ms16ms26.0kmAC Coupling to Micro/String Inverters Parallel Stacking UL1741SA / Rule 21 (California Sell only) $\checkmark$ </td <td>User Interface</td> <td>color touch</td> <td>touch</td> <td>Text</td> <td>Text</td> <td>Text</td> <td>Text</td> <td>Text</td> <td>touch</td> <td>Text</td> <td>х</td>	User Interface	color touch	touch	Text	Text	Text	Text	Text	touch	Text	х
AC to Batt Efficiency @ 65%       96.0%       93.0%       91.0%       90.0%       85.0%       91.5%       85.0%       85.0%       95.0%         Batt to AC Efficiency @ 65%       95.5%       93.0%       95.5%       90.0%       93.0%       92.5%       93.0%       91.0%       95.0%         On Grid PV to AC Efficiency @ 65%       96.5%       96.5%       96.5%       96.5%       96.5%       90.2%       88.5%       97.0%       95.5%       97.0%         Off Grid or Time of Use       PV -> Batt -> AC Losses @ 65%       7%       15% +       15%       21%       19%       10%       12%       25%       30%       13%         optional       0       380V       380V       0ptional       26KWh       26KWh       26KWh       45.4K       4515K       +57K       +511K       +57.2K       15KWh       45.4K       45.2K       26.4KWh       26.6Wh       26.6Wh       45.4K       26.4KWh       26.5Wh       16ms       16ms       16ms       2000ms       200ms       20ms       16ms       8ms       16ms       2000ms       2000ms       200ms       100 yr       12% 72.1K       10 yr       15/10 yr       5yr 72.1K       10 yr       12/20/25 yr       5/10 yr       5/10 yr       5/10 yr	PV to Batt Efficiency @ 65%	97.5%		92.0%	91.0%	91.0%	97.5%	96.0%	82.0%	80.5%	92.5%
Batt to AC Efficiency @ 65%         95.5%         93.0%         88.0%         90.0%         93.0%         92.5%         93.0%         91.0%         95.0%           On Grid PV to AC Efficiency @ 65%         96.5%         96.5%         96.5%         96.5%         96.5%         95.5%         90.2%         88.5%         97.0%         95.5% <td< td=""><td>AC to Batt Efficiency @ 65%</td><td>96.0%</td><td></td><td>93.0%</td><td>91.0%</td><td>90.0%</td><td>85.0%</td><td>91.5%</td><td>85.0%</td><td>85.0%</td><td>95.0%</td></td<>	AC to Batt Efficiency @ 65%	96.0%		93.0%	91.0%	90.0%	85.0%	91.5%	85.0%	85.0%	95.0%
On Grid PV to AC Efficiency @ 65%96.5%94.0%95.5%96.5%95.5%90.2%88.5%97.0%95.5%97.0%Off Grid or Time of Use PV -> Batt -> AC Losses @ 65%7%15%+15%21%19%10%12%25%30%13%Optional 17KWh26KWh26KWh20,5KWh98,8Wh20KWh26,8Wh26,8Wh26,8Wh45,72K26,8Wh26,8Wh45,72K16,8Wh45,72K16,8Wh45,72K16,8Wh26,8Wh <t< td=""><td>Batt to AC Efficiency @ 65%</td><td>95.5%</td><td></td><td>93.0%</td><td>88.0%</td><td>90.0%</td><td>93.0%</td><td>92.5%</td><td>93.0%</td><td><b>91.0%</b></td><td>95.0%</td></t<>	Batt to AC Efficiency @ 65%	95.5%		93.0%	88.0%	90.0%	93.0%	92.5%	93.0%	<b>91.0%</b>	95.0%
On Grid PV to AC Efficiency @ 65%       96.5%       96.5%       96.5%       90.2%       88.5%       97.0%       95.5%       97.0%         Off Grid or Time of Use       PV -> Batt -> AC Losses @ 65%       7%       15%+       15%       21%       19%       10%       12%       25%       30%       13%         optional       380V       380V       optional       26KWh       26KWh       26KWh       included       26KWh       +\$7.2K       26.4KWh       +\$4.3K       +\$7.2K       +\$7.2K       +\$7.2K       +\$7.2K       +\$7.2K       26.4KWh       +\$7.2K       26.4KWh       +\$7.2K       +\$7.2K       +\$7.2K       16ms       16ms       16ms       26.4KWh       +\$7.2K       26.4KWh       +\$7.2K       16ms       16ms       16ms       200ms       200ms       20ms       10ms       16ms       16ms       16ms       200ms       200ms       20ms       10ms       16ms       16ms       16ms       16ms       16ms       16ms       10ms       10ms <td></td>											
Off Grid or Time of Use PV -> Batt -> AC Losses @ 65%7%15%15%21%19%10%12%25%30%13%Optional 17KWh26KWh380V380Voptional 20KWh26KWh26KWh26KWh26KWh26KWh26KWh10%26KWh26KWh10%26KWh26KWh26KWh10%26KWh26KWh11%26KWh454.3K $+$7.2K$ $+$15K$ $+$7K$ $+$11K$ $+$7.2K$ $+$7.2K$ $+$7.2K$ $26KWh$ 26KWh $+$7.2K$ $26KWh$ $+$7.2K$ $+$7.2K$ $26KWh$ $+$7.2K$ $+$7.2K$ $26KWh$ $+$7.2K$ $+$7.2K$ $26KWh$ $+$7.2K$ $26KWh$ $+$7.2K$ $16KWh$ $+$7.2K$ $26KWh$ $-$7.2K$ $26KWh$ $-$7.2K$ $26KWh$ <td>On Grid PV to AC Efficiency @ 65%</td> <td>96.5%</td> <td>94.0%</td> <td>95.5%</td> <td>96.5%</td> <td>95.5%</td> <td>90.2%</td> <td>88.5%</td> <td>97.0%</td> <td>95.5%</td> <td>97.0%</td>	On Grid PV to AC Efficiency @ 65%	96.5%	94.0%	95.5%	96.5%	95.5%	90.2%	88.5%	97.0%	95.5%	97.0%
PV -> Batt -> AC Losses @ 65%       7%       15% +       15%       21%       19%       10%       12%       25%       30%       13%         optional       380V       380V       380V       0ptional       26KWh       20KWh       26KWh       26KWh       26KWh       26KWh       26KWh       26KWh       26KWh       4% <td>Off Grid or Time of Use</td> <td></td>	Off Grid or Time of Use										
And And Labor C construction of the formation of the forma	PV -> Batt -> AC Losses @ 65%	7%	15%+	15%	21%	19%	10%	12%	25%	30%	13%
optional 17KWh26KWh20.3KWh9.8KWh20KWh26KWh26KWhincluded26KWhincludedBattery Bank UPS Grid Failure Transfer Time $+$4.3K$ $+$7.2K$ $+$51K$ $+$7K$ $+$11K$ $+$7.2K$ $16KWh$ $+$7.2K$ $264Wh$ EMP/Solar Flare Hardened to >100KV/m Low Cost Easy Instal Warranty electronics NEC UL1699B Arc Fault $20m$ $100m$ $200m$ $20m$ $16m$ $8m$ $16m$ $16m$ $260m$ $AC Coupling to Micro/String InvertersParallel Stacking77$		1 /0	13/01		21/0		10/0	12/0	2370	3070	13/0
IncludedZ6kWhZ6kWhZ6kWhZ6kWhZ6kWhZ6kWhIncludedZ6kWhZ6kWhIncludedZ6kWhZ6kWhZ6kWhZ6kWhZ6kWhZ6kWhZ6kWhZ		optional		380V	380V	optional					
Battery Bank+\$4.3K+\$7.2K+\$15K+\$7.K+\$7.2K+\$7.2K+\$7.2K+\$7.2K+\$7.2K26.4KWhUPS Grid Failure Transfer Time2ms20ms100ms20ms20ms16ms8ms16ms16ms200msEMP/Solar Flare Hardened to >100KV/m+\$1.2KXX </td <td></td> <td>1/KWh</td> <td>26KWh</td> <td>20.3KWh</td> <td>9.8KWh</td> <td>20KWh</td> <td>26KWh</td> <td>26KWh</td> <td>included</td> <td>26KWh</td> <td>included</td>		1/KWh	26KWh	20.3KWh	9.8KWh	20KWh	26KWh	26KWh	included	26KWh	included
UPS Grid Failure Transfer Time2ms20ms1000ms20ms16ms8ms16ms16ms2000msoptional +\$1.2K	Battery Bank	+\$4.3K	+\$7.2K	+\$15K	+\$7К	+\$11K	+\$7.2K	+\$7.2K	16KWh	+\$7.2K	26.4KWh
EMP/Solar Flare Hardened to >100KV/m+\$1.2KXXX	UPS Grid Failure Transfer Time	2ms	20ms	1000ms	2000ms	20ms	16ms	8ms	16ms	16ms	2000ms
EMP/Solar Flare Hardened to >100KV/m       +\$1.2K       X </td <td></td> <td>optional</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		optional									
Low Cost Easy InstallVVXX	EMP/Solar Flare Hardened to >100KV/m	+\$1.2K	X	Х	X	X	X	X	X	X	X
Warranty electronics NEC UL1699B Arc Fault5/10 yr5 yr10 yr12/20/25 yr5/10 yr5 yr5 yr10 yr5 yr/25 yr10 yrAC Coupling to Micro/String Inverters Parallel Stacking✓✓✓	Low Cost Easy Install	✓	$\checkmark$	X	X	✓	X	X	X	X	X
NEC UL1699B Arc FaultImage: Complex c	Warranty electronics	5/10 yr	5 yr	10 yr	12/20/25 yr	5/10 yr	5 yr	5 yr	10 yr	5 yr / 25yr	10 yr
AC Coupling to Micro/String InvertersImage: Coupling to Micro/String In	NEC UL1699B Arc Fault		✓	√	<b>√</b>	Х	<b>√</b>	X	<b>√</b>	<b>√</b>	✓
Parallel StackingXXXX $\checkmark$ <td>AC Coupling to Micro/String Inverters</td> <td>✓</td> <td>Х</td> <td>X</td> <td>√</td> <td>X</td> <td><b>√</b></td> <td><b>√</b></td> <td><b>↓</b> ✓</td> <td><b>√</b></td> <td>✓</td>	AC Coupling to Micro/String Inverters	✓	Х	X	√	X	<b>√</b>	<b>√</b>	<b>↓</b> ✓	<b>√</b>	✓
UL1741SA / Rule 21 (California Sell only) X 🗸 🗸 🗸 🗸 X X	Parallel Stacking	X	X	X	X	✓	<b>√</b>	√	<b>√</b>	✓	✓
	UL1741SA / Rule 21 (California Sell only)	X	✓	✓	✓	✓	✓	X	✓	X	Х

### **Competitor Comparison**

### Battery Solar made Simple



### GRID-TIED, HYBRID OR OFF-GRID

- Simultaneously manages power to/from Solar, Battery, Grid, Load, and Generator
- Grid Tied Mode: Sell your power to reduce your electric bill
- Meter Zero Mode: Zero your electric bill without a smart meter
- **Time of Use:** Use solar and batteries to minimize grid power usage when its most expensive
- Smart Load: Use a programable output for high power off-grid items or Grid time of use items to run only when there is a lot of Solar (hot water, A/C, pumps, dehumidifier)

#### SIMPLE TO INSTALL & USE

- Few external components for faster install
- Easy to understand touchscreen interface



#### Wireless Monitoring & Remote Software updates







### Solar Batteries made Affordable



PCC = Partial Charge Carbon

#### Battery Option PCC-200: Partial Charge Carbon Sealed AGM

- 8.5 KWh bank w/ 4 batteries 48V
- ◊ 2800 cycles @ 50% DOD (7+ years, 12 years On Grid)
- Excellent Partial State of Charge, 3 year warranty

	Standard AGM	Sol-Ark PCC AGM	Lithium NMC	Lithium LFP	
10kWh Cost Range	\$1.6K to \$2.4K	\$2.5K to \$3.2K	\$5K to \$7K	\$8k to \$12K	
10kWh Cost	\$ 1,800	\$ 2,500	\$ 6,000	\$ 9,000	
Off Grid Cycles 50% DOD (Lab Conditions)	600	2800	4000	8000	
Off-Grid Cycles 50% DOD (Real World)	500	2250	2400	4800 to 7200	
Off Grid Years Typ (Real World)	1.4	6.2	6.6	13.2	
On Grid Years Typ	7	12	12	14	
Cost per Cycle	\$ 3.60	\$ 1.11	\$ 2.50	\$ 1.88	
Round Trip Efficiency	88%	98%	98%	98%	
Benefits	Lowest cost UPS backup	Lowest cost/cycle, partial SOC, efficiency	Small size, Partial SOC, efficiency, high charge rates	Small size, Partial SOC, efficiency, high charge rates	
Drawbacks	Size, cycles, partial SOC sulfates, >95F reduces cycle count 2x	Size, >95F reduces cycle count 2x	<32F reduces cycles 5x,95F reduces cycle count 2x, BMS reliability	<32F reduces cycles 5x,95F reduces cycle count 2x, BMS reliability	

### Battery Chemistry Cost Comparison



#### Sol-Ark-8K-48-ST Specifications

Solar	
Max allowed PV Power	11000W
Max allowed PV Power per MPPT	5500W
Max DC voltage	500V
MPPT voltage range	150-425V
Starting voltage	175V
Number of MPPT	2
Solar Strings per MPPT	2
Max DC current per MPPT	18A (self limiting)
AC Output	
Connections	120/240V split phase
	8000W 33A L-L (240V)
Continuous AC power on Solar or Battery	4000W 33A I -N (120V)
continuous ne power on solar or battery	20,000VA L-L (240V)
Surge AC nower 5sec	10,000VA I N (120V)
	10,000VA L-N (120V)
Trequency	12000W 50A L-L (240V)
Continuous AC nower with Crid or Consertor	C000)M/ F0A L NI (120)()
	06 F% (Deek 07 F%)
	96.5% (Peak 97.5%)
Idle Consumption typical – no load	60W Limited to Household or
Sell back power modes	Full Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	2ms
Battery (optional)	
Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	90 – 2000Ah
Voltage Range	41.0 - 61.0V
Continuous Battery charging output	190A
Charging curve	3-stage w/ equalization
Grid to Battery Charging Efficiency	96.0%
External temperature sensor	included
Current shunt for accurate % SOC	integrated
External Generator Start based on voltage or % SOC	integrated
Communication to Lithium battery	CanBus & RS485
General	
Dimensions (H x W x D)	28.0" x 17.375" x 9.37"
Weight	75 lbs
Enclosure	NEMA type 1 (Indoor Use)
Ambient Temperature (4 variable speed fans)	-25 to 55C, >45C derating
Display	Color touch screen
Wi-Fi Communication (monitoring or SW updates)	integrated
Snap on sensors for limited selling to Household	included
Standard Warranty	5 years
Optional Extended Warranty	10 years





<b>Protection &amp; Certifications</b>	
Electronics certified safety by SGS labs to NEC	
& UL specs – NEC 690.4B & NEC 705.4/6	Yes
Grid Sell Back – UL1741-2010/2018,	
IEEE1547a-2003/2014, FCC 15 class B	Yes
PV DC disconnect switch – NEC 240.15	integrated
Ground Fault Detection – NEC 690.5	integrated
PV rapid shutdown control – NEC 690.12	integrated
PV Arc Fault detection – NEC 690.11/UL1699B	integrated
PV input lightning protection	integrated
AC input/output 50A breakers	integrated
Battery overcurrent fuse	integrated
User wiring enclosure w/ ¾" & 1" knock-outs	integrated
Solar Flare/EMP Hardened to 2015 MIL-STD-	
461G (Independently tested June 2018)	optional