



## SOL-ARK 8K

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

World's Most Efficient Battery Inverter







**S&P GLOBAL PLATTS** 

GLOBAL ENERGY AWARDS 2018 FINALIST



FINALIST



# -A┌k® 8K Hybrid Solar Generator

## Resilient

- EMP/Solar Flare/Lightning Hardened to 2X military levels (MIL-STD-461G)
- 4ms Instant Battery Backup

## ${f A}_{\sf ffordable}$

- Expandable PV: 1.5KW to 11KW
- Batteries: Optional, 12KWh to 48KWh
- Payback Period = 7.5 years

## nnovative

- Most Efficient Battery Based Solar Storage Inverter in the World
- Affordable Solar Storage
- Easiest All in One Install and User Interface
- Smart Load: automatic On/Off Grid





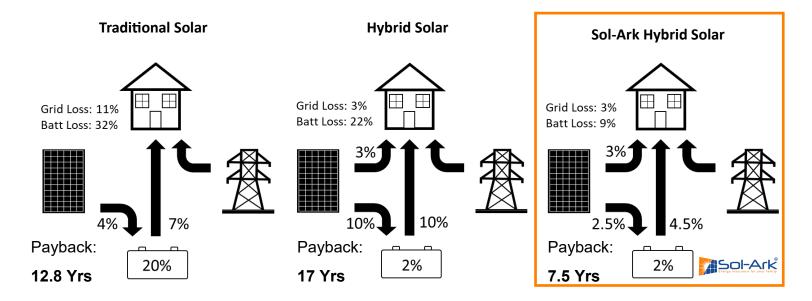
WARD

# Sustainable

- Lifespan: Panels = 50yrs
- Sol-Ark is a Solar Powered Generator made from Recyclable Materials
- Infinitely Recyclable Low Cost Batteries

## **E**fficient

• Saves \$4,000 on solar and \$1,500 on batteries on average



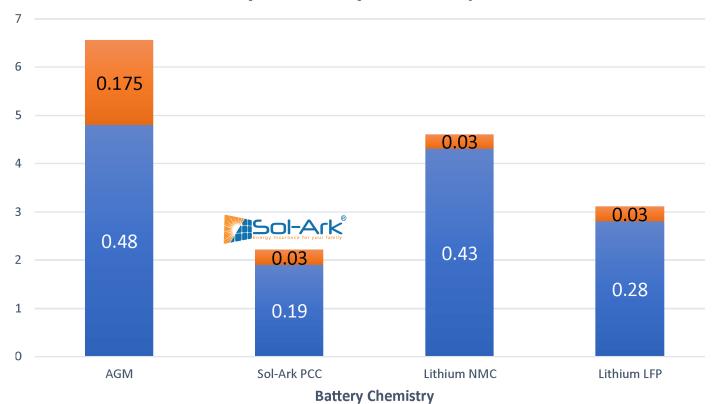
### Solar Batteries made Affordable

	Lead Acid (thick plate)		Lithium			
	Wet	AGM	PCC AGM	LFP	LiOn / NMC	Li Polymer
Round Trip Efficiency	80%	88%	98%	98%	98%	98%
Round Trip Losses w/ Sol-Ark	20%	12%	2%	2%	2%	2%
10KWh Cost (MSRP)	\$1,600	\$1,800	\$2,100	\$8,500	\$6,500	\$4,500
Off Grid Real World Cycles 50% DoD	1300	750	2400	6000	3000	1500
Off Grid Years @ 50% DoD	3.6	2.1	6.6	16.4	8.2	4.1
On Grid Years	9	7	12	15	12	9
Cost Per KWh Cycle	\$0.25	\$0.48	\$0.18	\$0.28	\$0.43	\$0.60
Cost of Oversizing 10KW PV @ \$4/W	\$8,000	\$4,800	\$800	\$800	\$800	\$800

Good for Emergency Backup

Good for Daily Cycling

#### **Battery Chemistry Cost Comparison**



■ \$/kWh of Battery

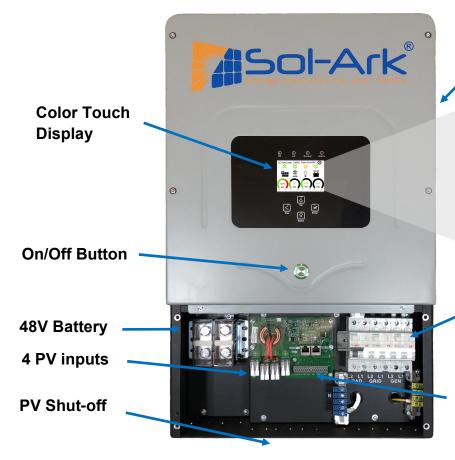
Additional \$/kWh Due to Inefficency



#### Sol-Ark's PCC-230 Battery: Partial Charge Carbon Sealed AGM

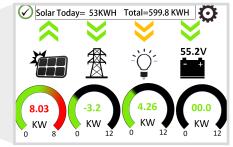
- ♦ 11 kWh bank w/ 4 batteries 48V
- 3000 cycles @ 50% DOD (7+ years, 12 years On Grid)
- Excellent Partial State of Charge, 5 year warranty
- ♦ UL 1989
- ♦ 12.7" x 22" x 6.1" (320 x 559 x 154mm)
- ♦ 160 Lbs

## Battery Solar made Simple



Wiring Knockouts & WiFi

**Quiet Variable-speed Fans** 



#### 120/240V 50A Breakers

- AC In/Out: 9kW
- AC Load Out: 20kWpk
- AC Gen In/Smart Load Out
- Battery Temp sensor
- Auto-Generator Start
- PV Rapid Shut Down
- External current sensors
- Battery communication

- Grid Tied Mode: Sell your power to the Grid
- Meter Zero Mode: Zero your whole home power
- Time of Use: Use batteries to avoid \$\$\$\$ power
- 120 / 240 / 208V

- Smart Load: Programable Loads for high power off-grid items saves battery capacity
- AC Coupling: add backup to 7kW of existing Grid Tie installs
- Peak Shaving: Reduces peak demand charges

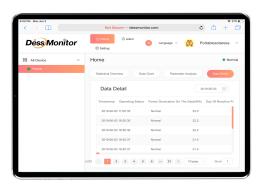
## EMP/CME/LIGHTNING PROTECTION

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

#### Wireless Monitoring & Remote Software updates





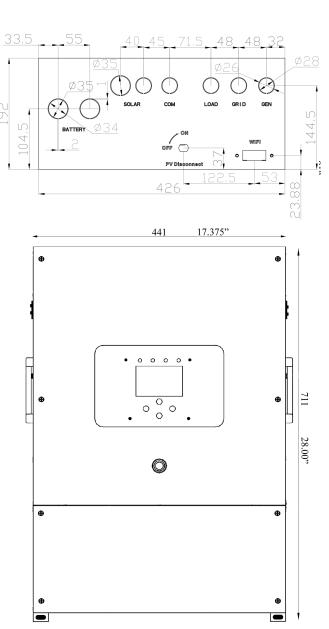


# Competitor Comparison

		Outback	Pika	SolarEdge		Outback	Schneider	Sonnen	Magnum	Tesla 2x
	Sol-Ark	Skybox	+ 009XX	7600A +	Darfon	Radian	XWPro6.8 +	ECO-16	2x4448PAE	Powerwall2
Brand & Model	<b>%</b>	SBX5048	4xS2500	32xP400	2xH5001	FPR-8048A	2xMPPT80	+ String Inv	+16xGT500	+ String Inv
MSRP Price	\$6,500	\$6,500	\$6,500	\$5,500	\$6,500	\$9,000	\$8,700	\$28,500	\$12,000	\$29,000
	м»6			7.6KW						
Inverter Continous Power	(8KW)	5KW	7.6KW	(Batt=5KW)	2x5.5KW	8KW	6.8KW	8KW	2x4KW	2x5KW
Off Grid Inverter Power peak (5s)	<b>20KW</b>	5KW	12KW	6.6KW	13KW	12KW	12KW	12KW	17KW	14KW
System Idle Power	M09	140W			200W	M9/	48W	M09	28W	78W
AC to DC Charger	185A	100A	6.7KW	2KW	120A	115A	140A	115A	120A	N/A
	color	color						color		
User Interface	touch	tonch	Text	Text	Text	Text	Text	touch	Text	×
PV to Batt Efficiency @ 65%	%5'.26	81.0%	92.0%	91.0%	91.0%	97.5%	<b>%0</b> '96	82.0%	80.5%	92.5%
AC to Batt Efficiency @ 65%	%0'96	80.0%	93.0%	91.0%	%0.06	85.0%	91.5%	85.0%	85.0%	95.0%
Batt to AC Efficiency @ 65%	95.5%	94.5%	93.0%	88.0%	%0.06	93.0%	92.5%	93.0%	91.0%	92.0%
On Grid PV to AC Efficiency @ 65%	96.5%	94.0%	95.5%	96.5%	95.5%	90.2%	88.5%	92.0%	95.5%	92.0%
i										
Off Grid or Time of Use PV -> Batt -> AC <i>Losses</i> @ 65%	<b>%</b> 2	24%	15%	21%	19%	10%	12%	25%	30%	13%
	optional		380V	380V	optional					
	24KWh	26KWh	20.3KWh	9.8KWh	20KWh	26KWh	26KWh	included	26KWh	included
Battery Bank	+\$5K	+\$7.2K	+\$15K	+\$7K	+\$11K	+\$7.2K	+\$7.2K	16KWh LFP	+\$7.2K	26.4KWh
<b>UPS Grid Failure Transfer Time</b>	4ms	20ms	1000ms	2000ms	20ms	8ms	8ms	100ms	16ms	2000ms
	optional									
EMP/Solar Flare Hardened to >100KV/m	+\$1.2K	×	×	×	×	×	×	×	×	×
Low Cost Easy Install	A	>	×	×	<b>/</b>	×	X	X	×	×
Warranty electronics	5/10 yr	5/10 yr	10 yr	12/20/25 yr	5/10 yr	5/10 yr	5 yr	10 yr	5 yr / 25yr	10 yr
NEC UL1699B Arc Fault	<i>^</i>	<i>&gt;</i>	<u> </u>	<i>^</i>	X	<i>^</i>	X	<i>^</i>	<i>^</i>	<b>/</b>
AC Coupling to Micro/String Inverters	<i>^</i>	X	X	<i>^</i>	Х	<b>/</b>	<i>^</i>	<i>^</i>	<i>^</i>	<b>/</b>
Parallel Stacking	×	<b>&gt;</b>	×	X	^	1	^	Х	^	<b>/</b>
UL1741SA/Rule 21 & 14H (Grid Sell only)	^	^	^	<i>^</i>	^	^	<i>^</i>	<i>^</i>	Х	×

Sol-Ark-8K-48-ST Specifications				
Solar				
Max allowed PV Power	11000W			
Max allowed PV Power per MPPT	6000W			
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)			
Max AC Coupled Input (Micro/String Inverters)	7,000W			
Max Combined Solar Input (DC+AC)	13,000W			
AC Output				
Connections	120/240V split phase			
	9000W 37.5A L-L (240V)			
Continuous AC power on Solar or Battery	4800W 40A L-N (120V)			
Surge AC power 5sec	20,000VA L-L (240V)			
Frequency	10,000VA L-N (120V) 60/50Hz			
	12000W 50A L-L (240V)			
Continuous AC power with Grid or Generator	6000W 50A L-N (120V)			
CEC Efficiency	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)	4ms			
Power Factor	+-0.9 - 1.0			
Battery (optional)				
Туре	Lead-Acid or Li-lon			
Nominal DC Input	48V			
Capacity	90 – 2000Ah			
Voltage Range	41.0 – 59.0V			
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		



Protection & Certifications				
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, (April				
2019: UL1741SA, CA Rule 21, HECO Rule 14H)	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			