

# Specification Power Conversion System

## PV Input

	LG AC 5kW	LG DC 7.6kW
Model Name	A005KEEN261	D007KEEN261
Absolute Maximum Input Voltage		450 V DC
Start-up Voltage		120 V DC
Operational DC Voltage Range		50 - 450 V DC
Full Power MPPT Range		270 - 450 V DC
Maximum Current per MPPT		12 A DC
MPP Tracker		3
	N/A	15min (high) / - 30min (default) / - 60min (low)
MPPT Scan (Shading Option)		Full range scan take less than 5s
MPPT Efficiency		>99.6% (Static), >99.3% (Dynamic)
DC Disconnect		Integrated
Input Terminal		Spring Type

## Battery Input / Output

Compatible Battery Pack Size	9.8 to 19.6 kWh @77°F(25°C) Max. 2 in parallel	
Rated I/O Power	5000 W	5000 W
Peak I/O Power(10 sec)	6000 W	7000 W
Acceptable Input Voltage Range	Charge/Discharge : 400 - 450 V DC / 350 - 430 V DC	
Rated I/O Current	Max. Charge/Discharge Current : 11.9 A@420 V / 14.3 A@350 V	
Peak I/O Current (10 sec)	18.9 A@370 V	
Cycle Efficiency Charging to Discharging (PCS Only)	Peak > 95 %	
DC Disconnect	Internal	
Fuse Rating	30 A	
Battery Terminal	Spring Type	

## AC Output (On-Grid Mode)

Maximum Output Power	5000 W	8000 W
Grid Voltage Range	a) 240 V AC +10%/-12%, (L-L) b) 208 V AC +10%/-12%, (L-L)	
Maximum AC Current	24 A AC	32 A AC
Frequency Range	59.3 - 60.5 Hz	
Power Factor	Cos phi = 0.85c - 0.85i Adjustable	
Harmonics Distortion	THD < 3%	
Grid support compliance	UL 1741 SA, CA Rule 21, HECO	
Revenue Grade Meter*	Optional	Built-in RGM
Output Terminal	Spring Type	

\* Complies with ANSI C12.20

## AC Output (Off-Grid Mode)

Output	Pure Sine-wave Voltage
Maximum Output Power	5000 W
Peak Output Power (10 sec)	6000 W
AC Output Voltage Range	240 V AC
Maximum AC current	21 A
Peak AC Current (10 sec)	25 A
Frequency Range	59.3 - 60.5 Hz
Voltage Harmonics Distortion @ 100% resistor load	THD < 5%
Maximum allowed Crest Factor	2.5 @5000W

## General PV to AC

	LG AC 5kW	LG DC 7.6kW
Isolation Level	Transformer-less	
Type of Converter	DC/AC	
CEC Efficiency	N/A	97.50%
Operating Temperature	-22 °F to 149 °F/ -30 - 65 °C	
De-rating Start Temp.	Higher than 113F (45 °C)	
Humidity	0 - 95%	
Maximum Operating Altitude	3000m above sea level De-rating above 2000m	
Audible Noise	< 40 dBA @ 1m	
MTBF	>500k hrs Calculated Acc. MIL Handbook	

## Battery

### Electrical Characteristics

Total Energy Capacity	9.8 kWh@25°C (77°F), 100% State of Energy	
Usable Energy Capacity <sup>1)</sup>	9.3 kWh	
Voltage Range	Charge	400 to 450 VDC
	Discharge	350 to 430 VDC
Absolute Max. Voltage	520VDC	
Max. Charge/Discharge Current	11.9A@420V / 14.3A@350V	
Max. Charge/Discharge Power <sup>2)</sup>	5kW	
Peak Power <sup>3)</sup> (only discharging)	7kW for 10 sec.	
Peak Current (only discharging)	18.9A@370V for 10 sec.	
Communication Interface	RS485	
DC Disconnect	Circuit Breaker	
Connection Method	Spring Type Connector	
User interface	LEDs for Normal and Fault operation	

### Operating Conditions

Installation Location	Indoor / Outdoor (Wall-Mounted)
Operating Temperature	14 to 113°F (-10 to 45°C)
Operating Temperature (Recommended)	59 to 86°F (15 to 30°C)
Storage Temperature -22 to 131°F (-30 to 55°C)	-22 to 131°F (-30 to 55°C)
Humidity	5% to 95%
Altitude	Max. 6,562ft (2,000m)
Cooling Strategy	Natural Convection

### Certification

Safety	Cell	UL1642
	Battery Pack	UL1973 / CE / RCM / TUV(IEC 62619)
Emissions	FCC	
Hazardous Materials Classification	Class 9	
Transportation	UN38.8	
Ingress Rating	IP 55	

1) Value for Battery Cell Only (Depth of Discharge 95%).

2) LG Chem recommends 3kW for maximum battery lifetime.

3) Peak current excludes repeated short duration (less than 10 sec. of current pattern).

## Contact

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# LG ESS

HOME ENERGY STORAGE SYSTEM



## The LG ESS - The Evolution of Home Energy Storage

LG is focusing its energy business on the next generation growth engine. LG is the only company that has comprehensive business capabilities throughout the energy value chain: Generation, Storage, Efficient Use, and Management. LG is one of the world's leading companies offering world-class technology and products for each segment: Energy generation (High Efficiency solar panels) and Efficient Use (electric vehicle battery, charger, smart LED/ OLED lighting, smart system air conditioner).

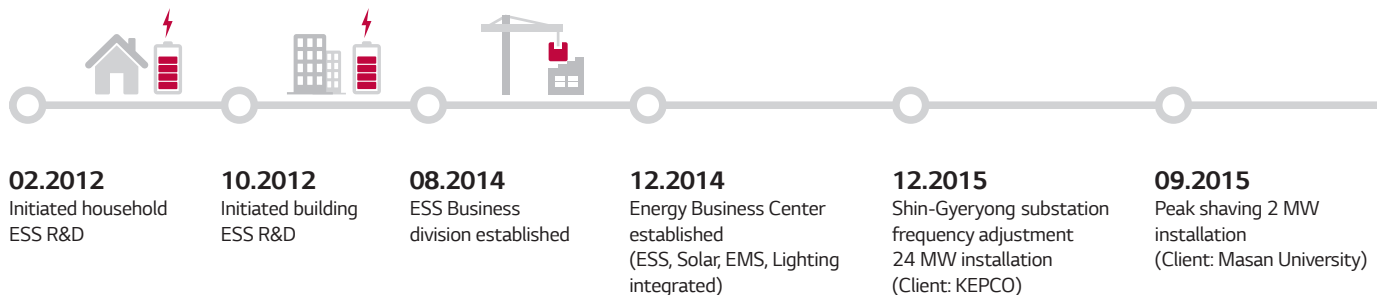
Now, LG introduces the home energy storage system(ESS), which maximizes the value of a homeowner's PV system.

The 7.6kW DC-coupled product offers unparalleled solar + storage performance, allowing homeowners to seamlessly store excess solar energy to power their home both day and night. The 5kW AC-coupled product can be easily added to an existing solar system, offering a reliable and cost-effective way to manage Time of Use (TOU) rates. Both AC-coupled and DC-coupled ESS products can provide back up power in case of a blackout



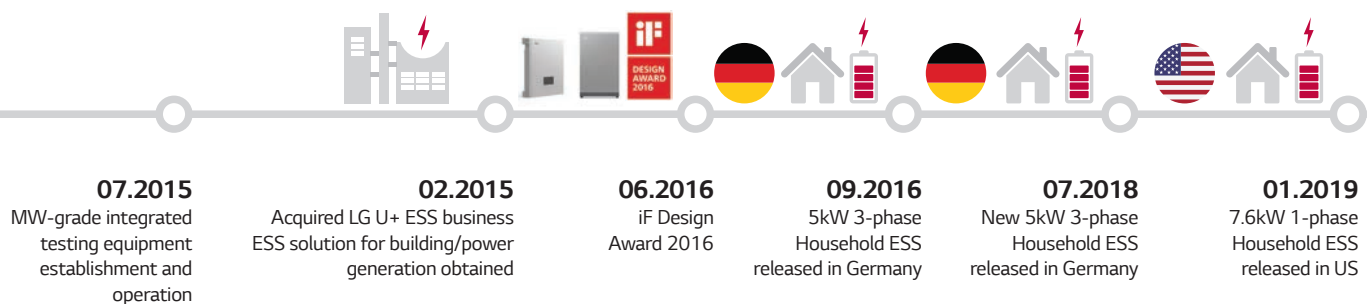
### One LG

LG ESS offers a solution for home energy management with technologically outstanding LG Solar Panels and a Home Energy Monitoring System (EnerVu). LG is ready to provide any solution you need for your home - having comprehensive technology in energy generation, storage, management, and energy-related business models. The LG ESS provides a one-stop shop option where we provide the LG Chem battery, PCS, and even the modules. This all-in-one solution means that LG can provide authoritative, professional support, offering its customers the level of service they deserve.





LG is constantly researching and developing products to provide world-class energy storage.



## Why the LG Home Energy Storage System?

### LG ESS helps maximize the efficiency of your home's renewable energy use.

For consumers, the biggest concern regarding energy is the increase in costs generally through their electricity bills. By adopting renewable energy generation equipment, such as photovoltaic panels, homeowners may be able to reduce their total energy costs. However, to obtain the best possible result, a strategic plan to maximize the self-consumption ratio of the generated power is needed. This can be achieved by adopting an effective Energy Storage System (ESS).

### This system ensures ease of product installation and use.

We at LG have focused considerable R&D efforts on ESS in order to provide a world-class system. Our home storage product helps save ESS installation costs, features compact design for a small footprint, optimized rapid shutdown (RSD) for NEC 2014-compliance, and ease of installation through a mobile application. It also features Wi-Fi connectivity with mobile devices to provide a straightforward monitoring function, LG EnerVu, that has been proven successful in the German ESS market.

### Rest assured with your choice of LG, the trusted company.

LG ESS is a complete solution with LG-made parts from solar modules to ESS, providing one solution with one warranty. LG offers a true one-stop solution – from the development incubation phase, through consulting, to design, with safety assured by certifying bodies in the United States and other parts of the world.



**One-stop service & 10-Year Warranty**  
ESS can be paired with LG PV modules for a single provider for all warranty issues



**Easy Two-Person Installation**  
Painless commissioning via Auto Self-Check

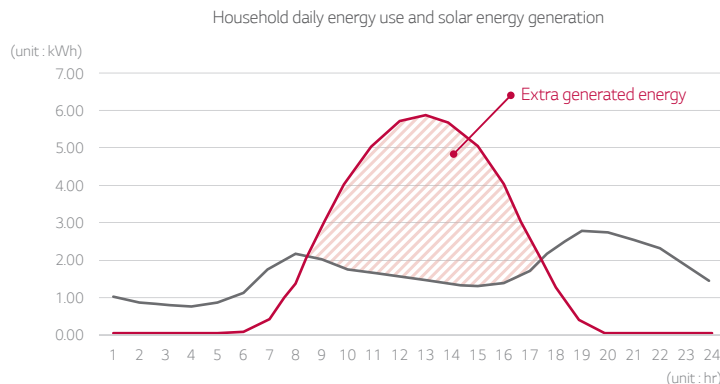


**Scalable and Extremely Reliable Battery**  
Up to 19.6kWh for longer back-up time

## How does the LG Home Energy Storage System work?

### Self-Consumption

If you are already planning to go solar, you can maximize your benefits even more by introducing an LG ESS at the same time. A typical household requires high energy during the morning and evening times. However, solar modules generate the most energy during the middle of the day, so all that excess energy is at risk of being wasted. The ESS enhances the efficiency of electric power use by allowing customers to store all that energy from the sun use when it is most needed.



### Back-up power

It is unimaginable to live a life without electricity, and a sudden power outage is never what any family wants. Loss of power leads to many inconveniences beyond frustration in the dark and food concerns. According to the U.S. Department of Energy, the annual economic loss due to power outages in the U.S. totals nearly \$150 billion. The LG ESS will always be ready to ride through a power outage by retaining a certain amount of charge on the battery. This emergency power function is extremely beneficial for customers living in areas where periodic hurricanes or frequent grid blackouts occur.





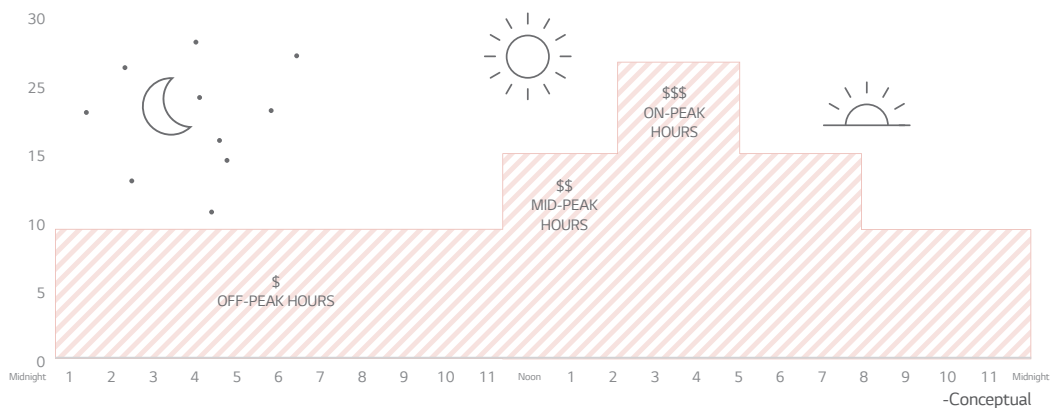
**Smart Energy Management and Remote System Monitoring**  
Emergency Back-up ; 24-7 energy monitoring



**High Efficiency PCS**  
Achieving 97.5% CEC Efficiency ;  
Multi-String & MPPTs for multi-angled roof

### Time of Use

The Net Energy Metering (NEM) program is great for homeowners with residential solar panels, but many utility companies want halt the program for fear of overloading the grid. Time of Use (TOU) electricity rates were mandated as the California Public Utilities Commission decided to maintain the NEM until 2019. This differential energy pricing for Peak and Off-Peak times justifies efforts to store self-generated energy. By using the time-setting function in EnerVu of LG ESS, the homeowner can avoid high prices by presetting their schedule to purchase energy to charge the battery from the grid during off-peak demand hours and limit the power purchased from the grid during peak demand hours.



## The LG ESS



## How is the LG Home Energy Storage System Installed?

The LG Electronics ESS is a state-of-the-art home energy management system designed for homeowners ready to take control of their home energy usage. The LG ESS is offered in both an AC-coupled and DC-coupled configuration. The 7.6kW DC-coupled solution with a high efficiency PV inverter is well-suited for new solar PV + storage installations. The 5kW AC-coupled solution is ideal for customers looking to install an ESS in a home with an existing solar system.



LG ESS PCS



Primary Battery



Auto-Transfer Switch



Energy Meter



Rapid  
Shutdown Box  
for NEC 2014  
(DC-coupled only)



Secondary Battery  
(optional)



## LG Installation App and Web Monitoring

The LG Electronics Web-monitoring system and installation tool, EnerVu, is not just a monitoring tool. It also provides detailed PV analysis to customers. For the end customer, EnerVu is more and more becoming a brain for managing and operating energy flows. For the installer, it has become the key to an easy installation and a personalized, data-based customer service.

### Benefits of EnerVu

- Remote firmware update
- Easy Wi-Fi installation
- Automatic system faults notification
- Energy profiling function

**With LG EnerVu, enjoy easy monitoring of your energy harvesting.**

