

## PRODUCT BROCHURE

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*the affordable*  
energy storage  
**People**

# We're Polar ESS



## Polar ESS, a proprietary brand of GivEnergy.

As an industry-leading provider of full range energy storage systems, Polar ESS integrates R&D, manufacturing, and service to deliver comprehensive solutions for residential, commercial, and industrial applications.

Our complete ecosystem—from hybrid inverters and high-performance batteries to intelligent cloud platforms—making safe, efficient, and sustainable power solutions universally available.



Industry-leading inverters



Batteries



Energy management software



### Mission

Reshaping the future of energy, empowering green living.



### Vision

Together towards a carbon-neutral future.

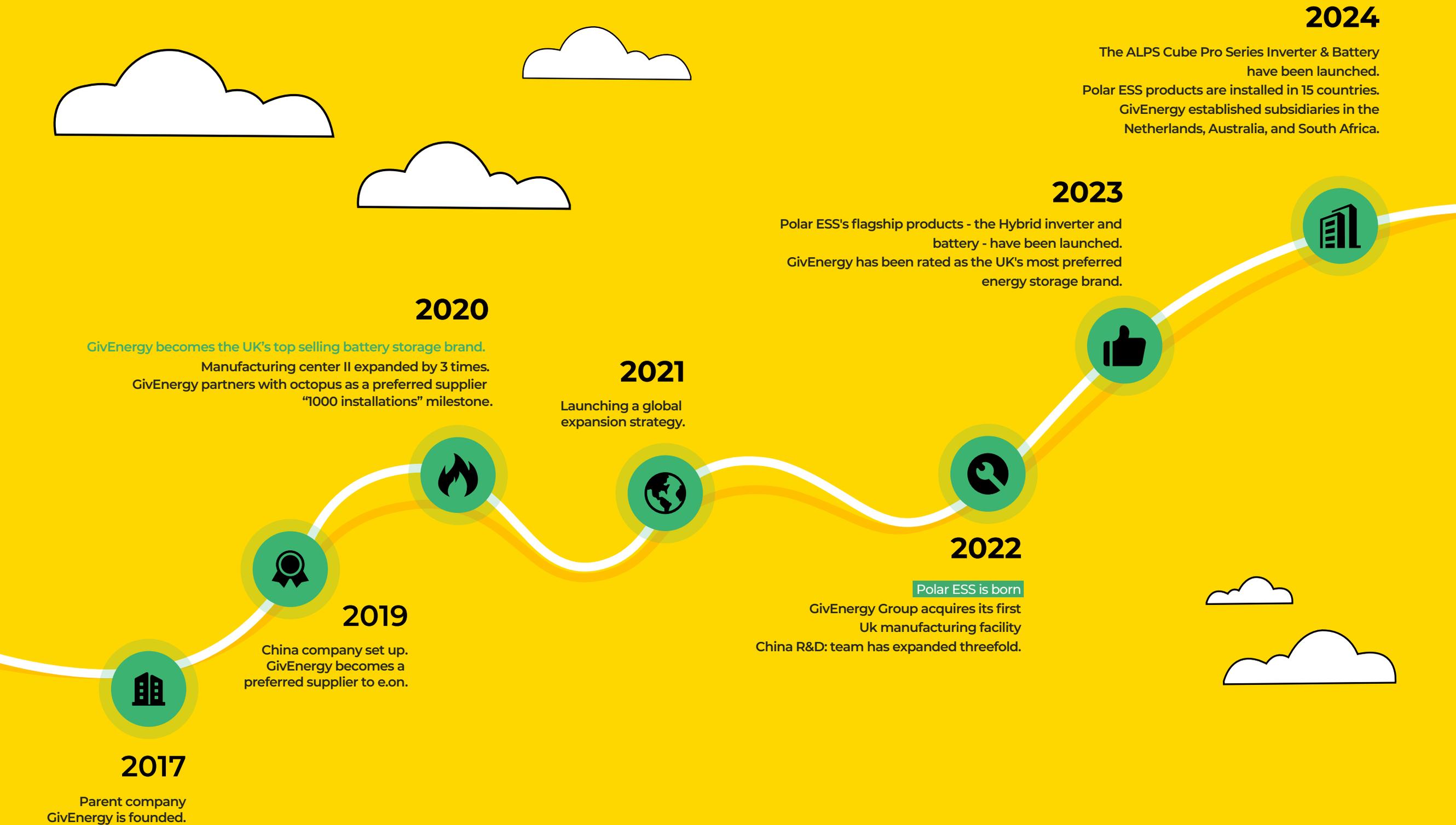
# Features and Advantages of Polar ESS



Polar ESS stands out as a one-stop energy solution provider with strong in-house software and hardware development capabilities. This ensures seamless and compatible communication across various products. Polar ESS begins with user needs and manages the entire process in-house, including design, research, production, sales, and after-sales support, allowing for efficient cost control and precise quality management.



# Key Milestones



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## Residential ESS

### Single Phase AIO ESS P07



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- POL-AIO-AC-13.5-10.0
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## Commercial & Industrial ESS



#### SME C&I ESS

- Polar-SME 30/64 -ID
- Polar-SME 50/64 -ID

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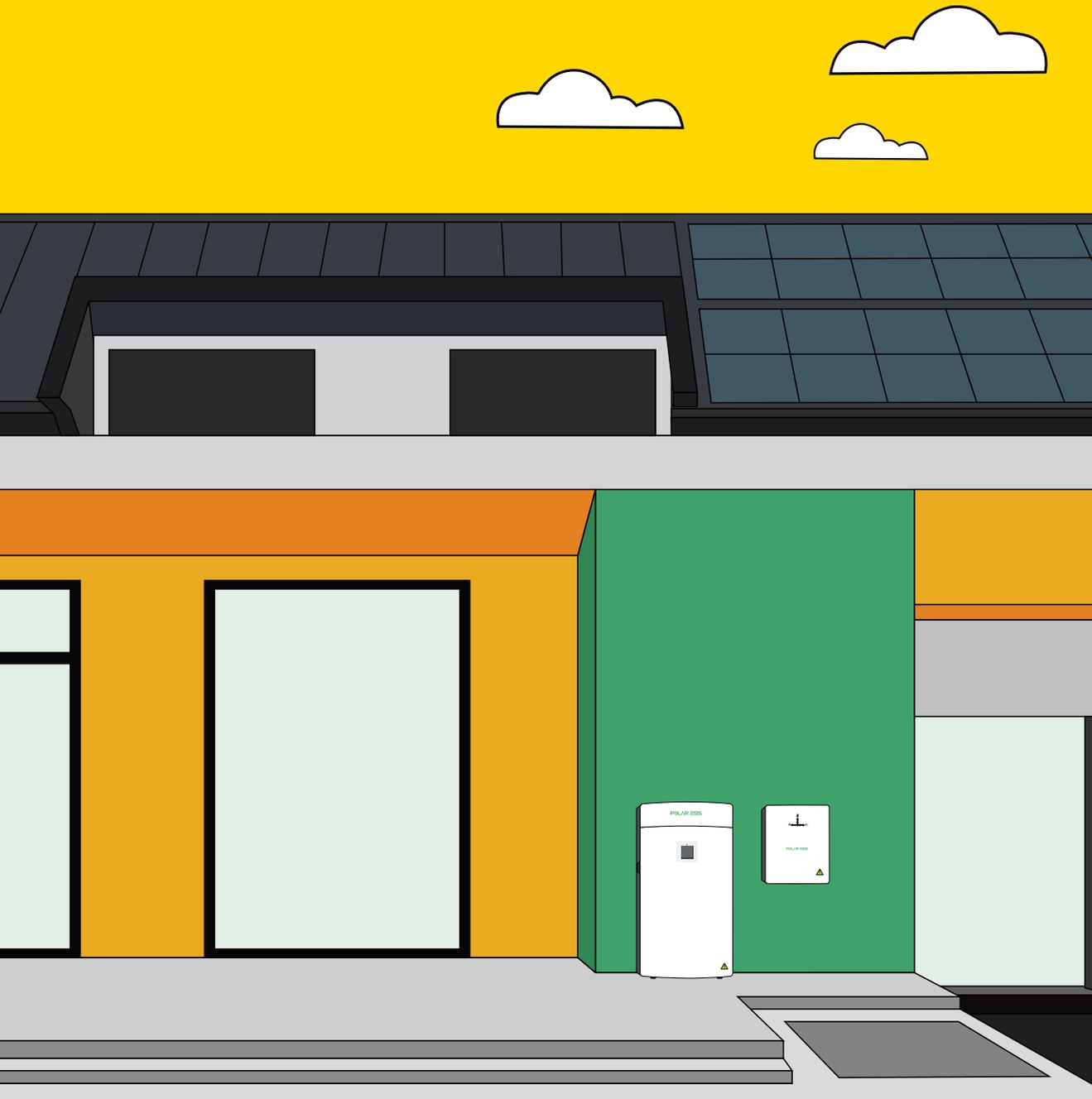
## Monitoring Cloud Platform



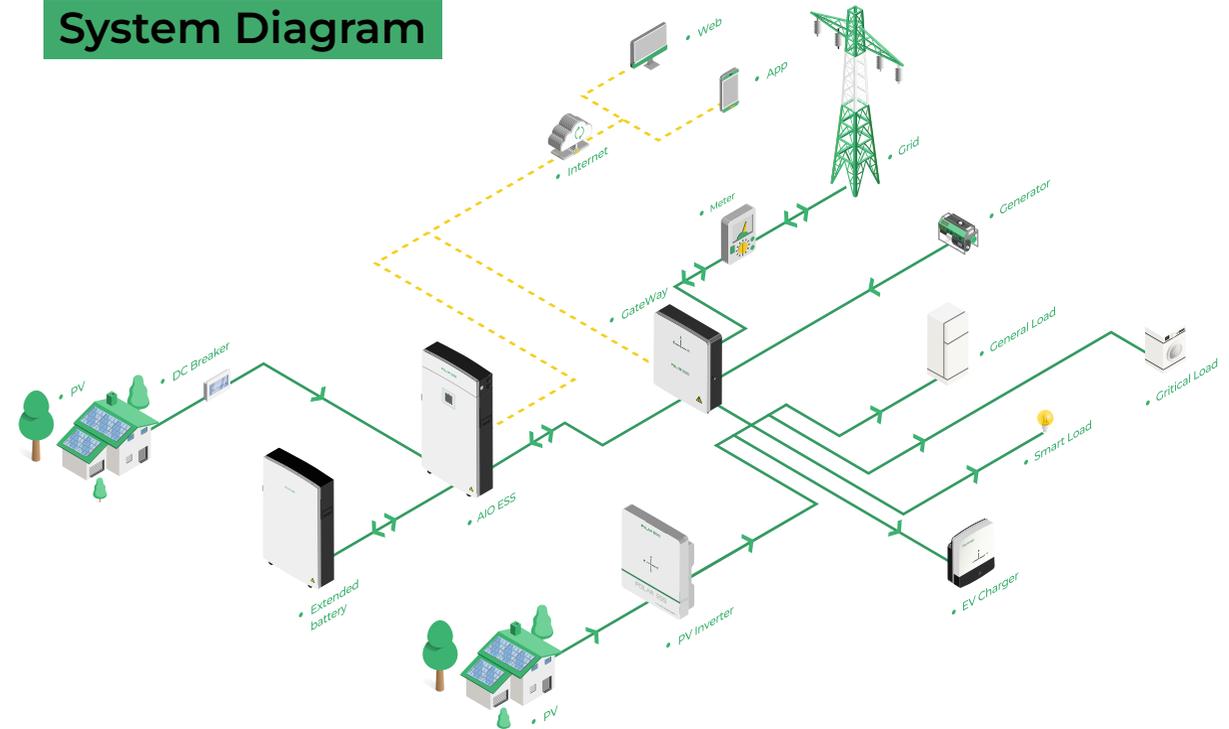
#### Portal App

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# Single Phase AIO Energy Storage System



## System Diagram



The MPPTs, PCS, battery pack, BMS, EMS, intelligent air cooling systems are seamlessly integrated within a compact cabinet.

### All-in-one Integration



12kW high-power output integrated from the grid, off-grid can withstand 1.2 times the excess output (10s), suitable for high-power home applications and off-grid shock load stable applications.

### Sufficient Power Supply



Simple and efficient installation and line connection, faster and more efficient construction, saving preparation time, efficient web page and APP application, shortening commissioning and application time.

### Easy to Install & Operate

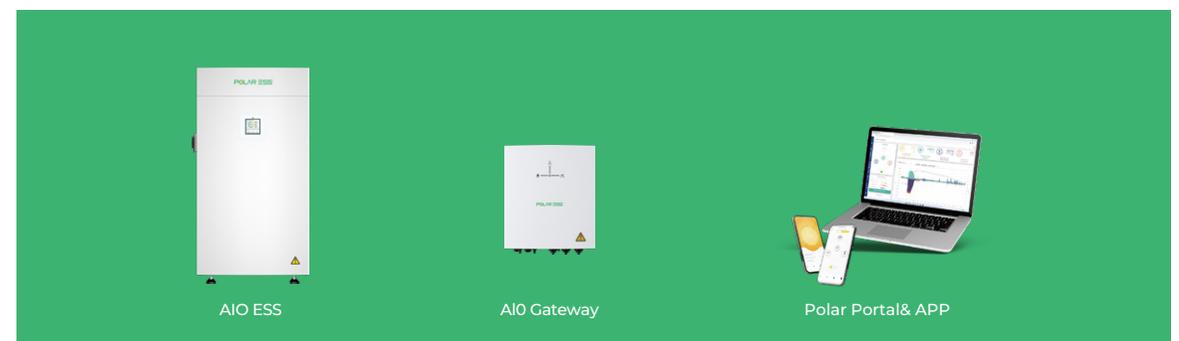


All data, including cell voltages, pack temperatures, power and energy values, are regularly reported to the cloud. Mode selection and timed control are available via the web or APP, enabling a full remote monitoring platform.

### Online Monitoring



## System Components





AIO ESS

## AIO ESS 8.0/10.0/12.0kW

**6** 6 MPPTs, with max.20kW PV input.

**12kW AC output, with max. 1.2 times overload ability (10s).**

**Plug and play.**

**Scalable with max. 3pcs battery bank.**

**Touchable LCD, and advanced cloud platform.**

**Smart loads management, via intelligent gateway.**

Model	POL-AIO-AC-13.5-8.0	POL-AIO-AC-13.5-10.0	POL-AIO-AC-13.5-12.0
<b>Input Data(PV)</b>			
Max. DC Input power	13,000W	16,500W	20,000W
Max. DC Input Power Of Single MPP Tracker		4,500W	
Start-up Voltage		60V	
Max. PV Open-circuit Voltage		600V	
MPPT Voltage Range		80V-550V	
Rated MPPT Voltage		360V	
Max. Input Current		6*17A	
Max. PV Short-circuit Current		6*23A	
MPP Tracker/No. Of Strings Per MPP Tracker		6/1	
<b>Battery</b>			
Battery Type		Li-ion	
Battery Voltage Range		260-346V	
Nominal Voltage		307V	
Max. Charging/Discharging Current	25A /41A	25A/41A	25A /41A
Max. Battery Charging/Discharging Power	6,000W/8,600W	6,000W/10,600W	6,000W/12,600W
Battery Communication		CAN	
Battery Capacity		13.5kWh	
<b>Output Data (AC, On/Off Grid)</b>			
Rated AC Output Power	8,000W	10,000W	12,000W
Max. Apparent Power	8,000VA	10,000VA	12,000VA
Nominal Off-grid Power		12,000VA	
Peak Power (10s, Off-grid)		14,400VA	
Rated/Max. Output Current	34.8A	43.5A	52A
Nominal Grid Voltage/Range		230 V.a.c(180 to 270V.a.c)	
Nominal Frequency/Range		50 /60Hz; ±5Hz	
Power Factor(@Full Load)		>0.99	
Power Factor Range		0.8lagging-0.8leading	
THDI (@Rated Power)		<3%	
AC Output Type		Single phase; L+N+PE	
<b>General Data</b>			
Battery Max. Charging/Discharging Efficiency		96.50%	
Max. PV Efficiency	97.10%	97.30%	97.50%
Euro Efficiency	96.60%	96.80%	97%
PV MPPT Efficiency		99.90%	
Ingress Protection		IP65	
Protection Class		Class I	
Overvoltage Category		PV: II, Battery: II, AC: III	
Inverter Topology		PV: Transformer-less; Battery: Transformer-less	
Cooling		Smart Fan Cooling	
Noise Emission (Typical)		≤50dB	
Operating Temperature Range		-20~+50 C	
Relative Humidity		0-100%, Non-condensing	
Altitude		4000m(Derating Above 2000 m)	
Dimensions (WxHxD)		600x1095x280(mm)	
Weight		231kg	
Self-consumption		<15W	
Max. Parallel Units		3	
Display		LCD &&APP	
Interface		RS485/WIFI/4G inside	
Warranty		5 years	
Certificates		IEC62619, IEC62040, IEC62477, IEC62109-1, IEC62109-2, AS/NZS4777.2:2020+A1, EN IEC 61000-6-3, EN IEC 61000-6-1	

Remarks\*1: Test condition at 25 C ±2 C, 0.5C/0.5C,90%DOD



GATEWAY

## AIO Gateway Intelligent Management Box

- 
 Multi-load system distribution management.
- 
 IP65, plug and play.
- 
 Intelligent load power scheduling.

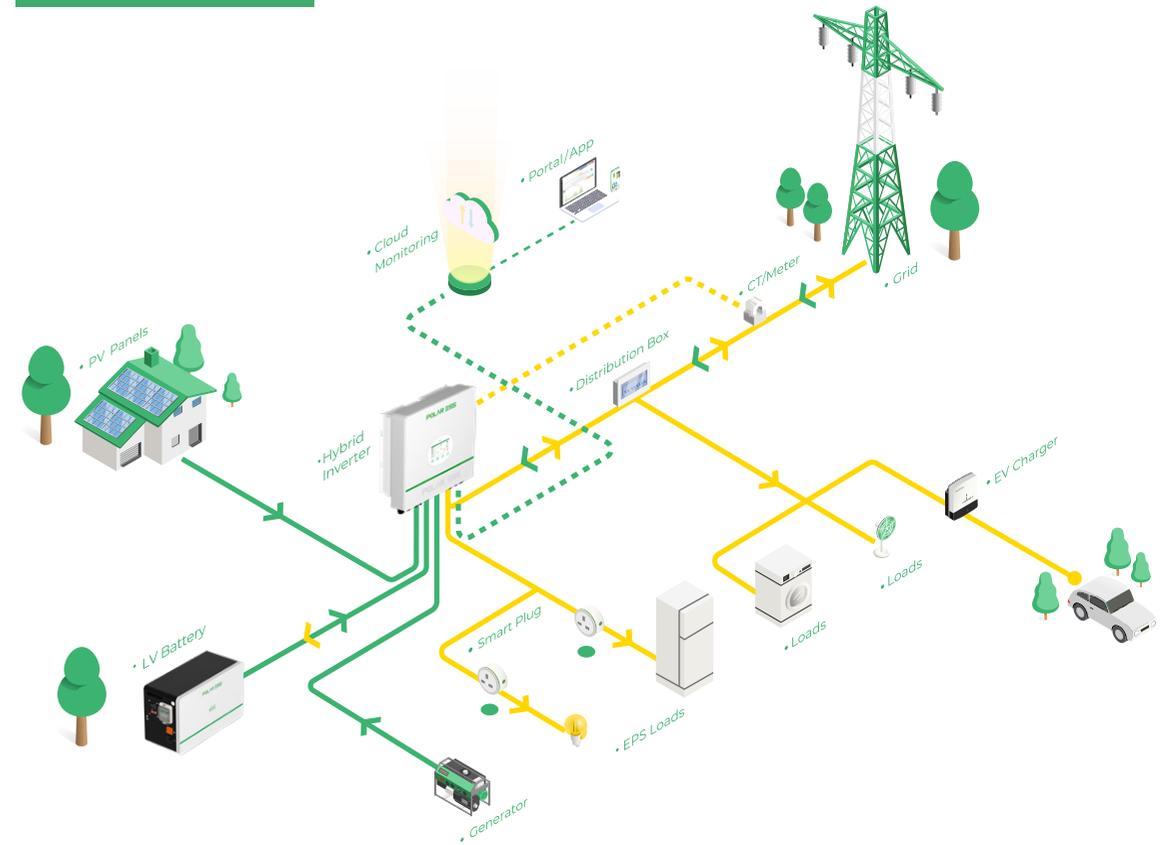
- 
 Maximum 100A load access.
- 
 Diesel generator access support, intelligent SOC control.
- 
 Multiple AIOs can be connected for scheduling.

Model	POL-AIO-GW1-2
<b>Grid Output AC</b>	
Nominal AC Power	23000W
Nominal AC Current	100A
Max. AC Current	100A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Grid Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	100A
<b>General Load Output AC</b>	
Nominal AC Power	23000W
Nominal AC Current	100A
Max. AC Current	100A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Grid Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	100A
<b>Critical Load Output AC</b>	
Nominal AC Power	9200W
Nominal AC Current	40A
Max. AC Current	40A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Grid Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	40A
<b>Smart Load Output AC</b>	
Nominal AC Power	9200W
Nominal AC Current	40A
Max. AC Current	40A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Grid Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	40A
<b>Generator Output AC</b>	
Nominal AC Power	9200W
Nominal AC Current	90A
Max. AC Current	90A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Grid Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	90A
<b>EV Charger Output AC</b>	
Nominal AC Power	7200W
Nominal AC Current	32A
Max. AC Current	32A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Frequency	50/60±5Hz
Maximum Output Fault Current	6000A
Maximum Output Overcurrent Protection	32A
<b>AIO Input AC</b>	
Nominal AC Current	52A
Max. AC Current	52A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Frequency	50/60±5Hz
<b>PV Input AC</b>	
Nominal AC Current	43A
Max. AC Current	43A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Frequency	50/60±5Hz
<b>AIO Parallel Input AC</b>	
Nominal AC Current	52A
Max. AC Current	52A
Rated Voltage	230V.a.c (180 To 270V.a.c)
Rated Frequency	50/60±5Hz
<b>General Data</b>	
Dimensions(WxHxD)	380x460x150(mm)
Weight	18Kg
Protective Class	Class I
Operating Temperature Range	-20 ~ +50°C
Ingress Protection	IP65
Certification	IEC 62109-1, IEC 61000-6-1, EC 61000-6-3, AS/NZS4777.2:2020+A1

# Single Phase POL Energy Storage System



## System Diagram



### Whole-Home Backup

Delivers uninterrupted power to your entire home during grid outages, keeping all essential systems and appliances running smoothly.



### Diesel Generator Support

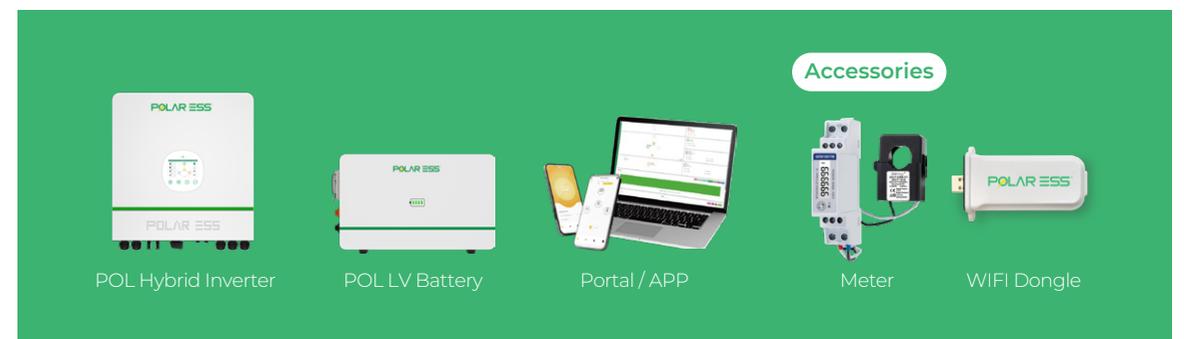
Integrates seamlessly with diesel backup power during outages to ensure a continuous electricity supply.

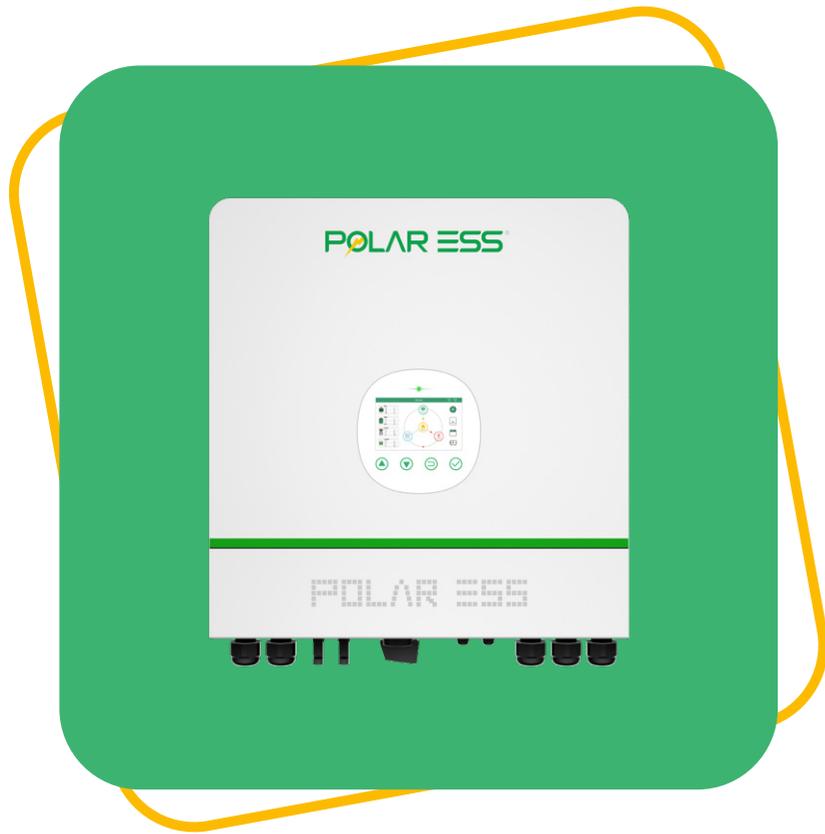


### Versatile Applications

Compatible with AC-coupled systems, microgrids, smart loads, and more. We provide tailored solutions for both new solar installations and energy upgrades.

## System Components





# HYBRID INVERTER

## POL Hybrid Inverter 3.6/4.6/5.0/6.0/8.0KW

2 MPPTs, with max.12kW PV input.

8kW AC output, with on/off grid, 2 times overload ability (10s).

Touchable LCD, and advanced cloud platform.

10 section battery time settings, free deployment of the use period.

Max. 6 units in parallel, on/off-grid synchronous application.

Integrated with Gen port, support diesel generator, and smart load.

Model	POL-HY-3.6-GL	POL-HY-4.6-GL	POL-HY-5.0-GL	POL-HY-6.0-GL	POL-HY-8.0-GL
<b>Input Data (PV)</b>					
Max. DC Input Power	5400W	7000W	7500W	9000W	12000W
Max. PV Open-circuit Voltage	550V				
Start-up Voltage	90V				
MPPT Voltage Range	90V-530V				
Rated MPPT Voltage	360V				
Max. PV Input Current	17A/17A				20A/20A
Max. PV Short-circuit Current	23A/23A				
MPP Tracker/No. of Strings Per MPP Tracker	2/1				
<b>Battery</b>					
Battery Type	Li-ion/Lead-acid				
Battery Voltage Range	40-60V				
Max. Charging Current	83A	104A	112A	130A	175A
Max. Discharging Current	83A	104A	112A	130A	175A
Nominal Voltage	51.2V				
Battery Communication	RS485/CAN				
<b>Output Data(AC, On-grid)</b>					
Rated/Max. AC Output Power	3600W	4600W	5000W	6000W	8000W
Max. Apparent Power	3600W	4600W	5000W	6000W	8000W
Nominal Grid Voltage/Range	230V.a.c; 180--260V.a.c				
Rated/Max. Current	16A.a.c.	20A.a.c.	21.7A.a.c.	26A.a.c.	34.7A.a.c.
Pass Through Current (From Grid To Off Grid)	50A.a.c.				
Nominal Frequency/Range	50Hz/60Hz; ±5Hz				
Power Factor(@Full Load)	>0.99				
Power Factor Adjustable Range	0.8lagging-0.8leading				
THDi (@Rate Power)	<3%				
AC Output Type	Single Phase; L+N+PE				
<b>Output Data (AC, Backup)</b>					
Nominal EPS Output Power	3600W	4600W	5000W	6000W	8000W
EPS Peak Power(10s)	2 Times Of Rated Power, 10s				
AC Nominal Voltage	230V.a.c				
Rated/Max. Output Current	16A.a.c.	20A.a.c.	21.7A.a.c.	26A.a.c.	34.7A.a.c.
Nominal Frequency	50/60Hz				
Automatic Switch Time	≤10ms				
THDv(Linear Load)	<3%				
<b>General Data</b>					
Battery Max. Charging/Discharging Efficiency	94%/94%				
PV To AC Max. Efficiency	97.5%				
Euro Efficiency	96.5%				
PV MPPT Efficiency	99.9%				
Ingress Protection	IP65				
Noise Emission (Typical)	<30dB	<30dB	<30dB	<30dB	<45dB
Operating Temperature Range	-25--+60 C				
Full Load Operation Temperature	-25--+45 C				
Storage Temperature	-10--+45 C				
Cooling	Natural				Intelligent Cooling
Max. Altitude	4000m(Derating Above 2000 m)				
Dimensions (WxHxD)	480x500x210(mm)				
Weight	18kg				20kg
Max. Parallel Units	6				
Self-consumption	<10W				
Protective Class	Class I				
Overvoltage Category	PV: II, Battery: II, AC: III				
Topology	PV: Transformer-less; Battery: Isolated				
Display	LCD/LED&APP				
Interface	Communication With Meter--Pluggable Connector Communication With Portal--Wi-Fi(USB)				
Monitoring	WIFI/4G Optional				
Certificates	CE, EN50549, UKCA, NTS2.1, UNE217001, UNE 217, NRS097, G98, G99, C10/11, VDE-N4105, NTS2.1, UNE217001, AS4777.2				
Warranty	5 Year				



# LV BATTERY

## POL LV Battery 5.0/10.0/15.0kWh

Long life LiFePO4 cell.

Max. parallel 5 pcs, 25.6/51.2/71.83kWh capacity support.

6000+ cycles support.

Wall or floor mounting.

Intelligent self-developed BMS, ensure the safe battery working.

IP65 sleek shiny design.

Model	POL-BAT-5.0-W	POL-BAT-10.0-W	POL-BAT-15.0-W
<b>Battery Moudles</b>			
Cell Type	LFP		
Battery Energy	5.12kWh	10.24kWh	14.336kWh
Cell Capacity	100Ah	200Ah	280Ah
Nominal Voltage	51.2V		
Battery Module Voltage Range	44.8-57.6V (Cell 2.8-3.6V)		
Nominal Current	100A	150A	160A
Maximum Continuous Charging And Discharging Current	100A/100A	160A/160A	160/160A
Peak Current	125A/3s	180A/3s	200A/3s
Cycle Life <sup>1</sup>	6000		
DOD(Depth Of Discharge)	93%		
<b>General Data</b>			
Dimensions(WxHxD)	520x310x224(mm)	520x585x224(mm)	480x670x230(mm)
Weight	44±2kg	81±2kg	115±2kg
Charging Temperature	-0 ~ 55 C		
Discharging Temperature	-10 ~ 55 C		
Storage Temperature	46 C ~ 55 C @ 7day SOC ≥ 30% 36 C ~ 45 C @ 6months SOC ≥ 30% -20 C ~ 35 C @ 1year SOC ≥ 50% (Perform Maintenance Every 6 Months)		
Parallel Quantity	5		
BMS Communication	CAN/RS485		
Installation	Wall mounted / Ground mounted		
Ingress Protection	IP65(battery & Electricity)		
PACK Certification	CE, UN38.3, MSDS, IEC 62619		
Warranty	5 Year		

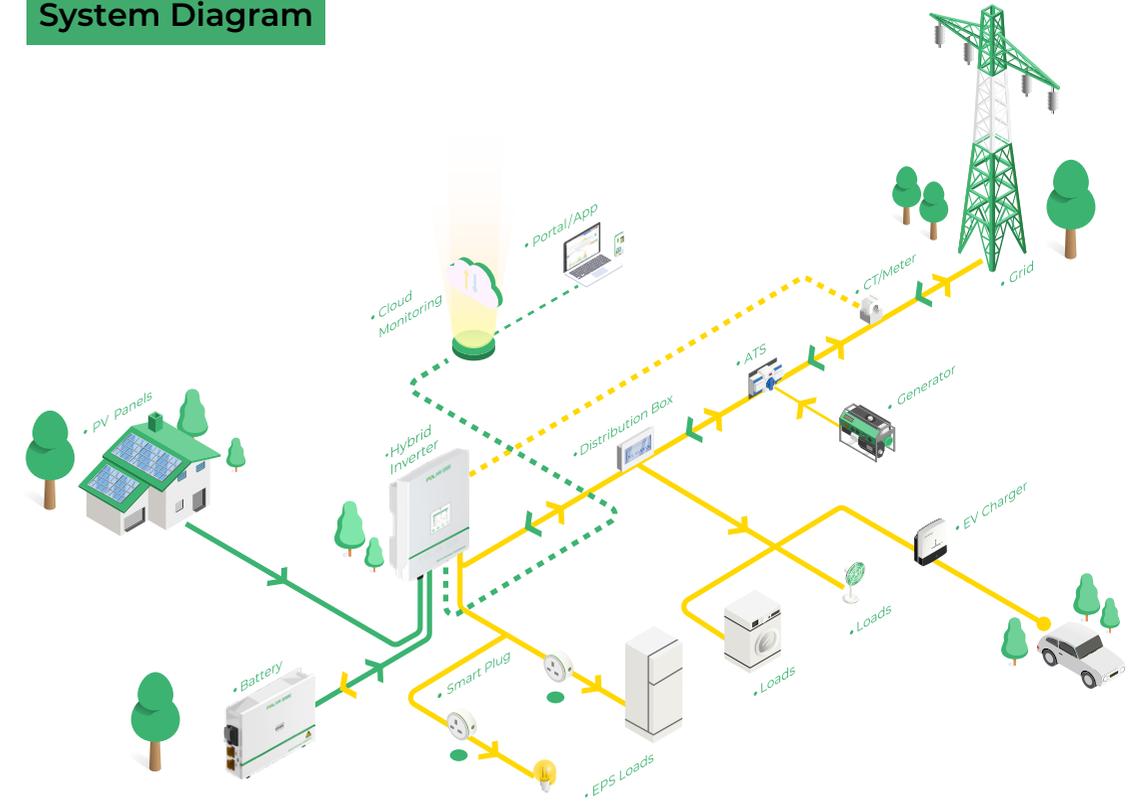
Remarks<sup>1</sup>: Test Condition At 25 C ± 2 C, 0.5C/0.5C, 90%DOD



# Single Phase Alps Cube Pro Energy Storage System



## System Diagram



### Whole-Home Backup

Provides uninterrupted power to your entire home during grid outages, keeping all essential systems and appliances running smoothly.



### Control Your Energy

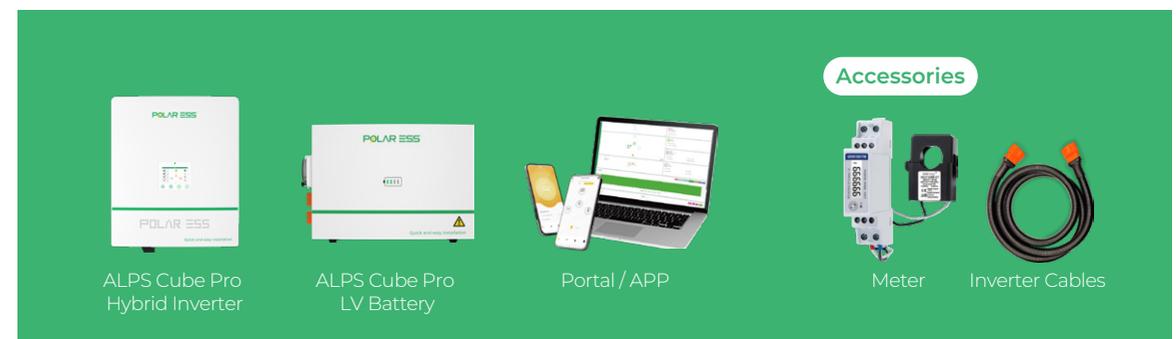
Seamlessly monitor and automatically manage your inverter, solar panels, batteries, loads, etc. with the Polar ESS App.

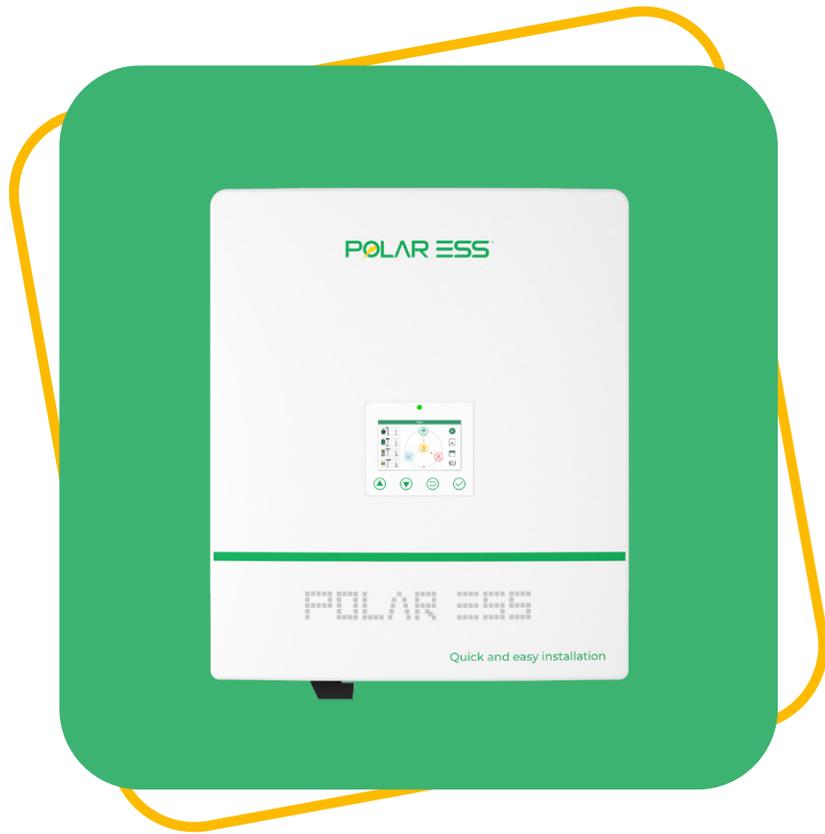


### Robust

IP65 water and dust resistant, installable indoors or outdoors, and durable enough to function between -10 - 50°C.

## System Components





HYBRID INVERTER

## ALPS Cube Pro Hybrid Inverter 3.6/4.6/5.0/6.0KW

 2 MPPTs, with max.9kW PV input.

 6kW AC output, with on/off grid, 1.5 times overload ability (10s).

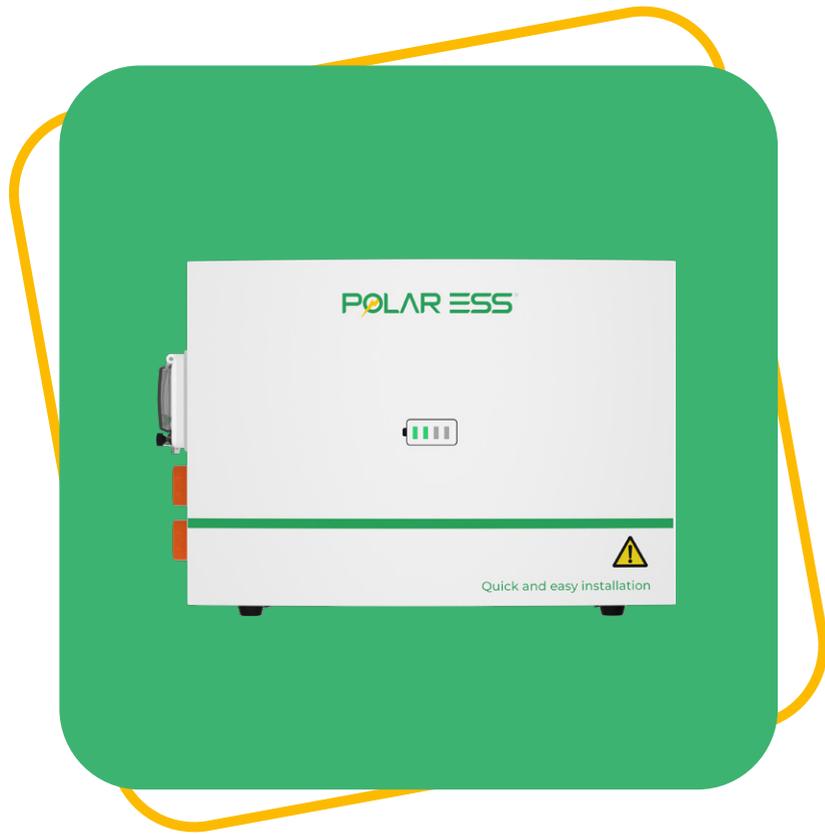
 Touchable LCD, and advanced cloud platform.

 Die casting integrated IP65 fanless silent design.

 6 units in parallel, on/off-grid synchronous application.

 Plug and play.

Model	ALPS Cube HY3.6 Pro	ALPS Cube HY4.6 Pro	ALPS Cube HY5.0 Pro	ALPS Cube HY6.0 Pro
<b>Input Data (PV)</b>				
Max. DC Input Power	5400W	6900W	7500W	9000W
Start-up Voltage	80V			
Max. PV Voltage	600V			
MPPT Range	90V-550V			
Nominal Voltage	360V			
Max. Short-circuit Current	2*23A			
Max. Input Current	17A/17A			
MPPT Tracker/ No. of Strings Per MPPT Tracker	2/1			
<b>Battery</b>				
Battery Type	Li-ion/Lead-acid			
Battery Voltage Range	46.7-57.6V			
Nominal Voltage	48V			
Charge/ Discharge Current	83A/83A	104A/104A	120A/120A	120A/120A
Max. Battery Charge/ Discharge Power	4000W/4000W	5000W/5000W	5800W/5800W	5800W/5800W
Communication Interface	RS485/CAN			
<b>Output Data(AC, On-grid)</b>				
Nominal AC Output Power	3600W	4600W	5000W	6000W
Max. Apparent Power	3600W	4600W	5000W	6000VA
Max. Output Current	16A	20A	21.7A	26A
Nominal Grid Voltage/Range	230V.a.c; 180--270V.a.c			
Nominal Frequency/Range	50 /60Hz; ±5Hz			
Power Factor (@Full Load)	>0.99			
Power Factor(@Full Load)	0.8 Lagging - 0.8 Leading			
THDi (@Rate Power)	<3%			
AC Output Type	Single Phase;L+N+PE			
<b>Output Data(AC, Back-up)</b>				
Nominal EPS Output Power	3600W	4600W	5000W	5500W
Nominal Voltage	230Va.c.			
Rated/Max. Output Current	16Aa.c.	20Aa.c.	21.7Aa.c.	26Aa.c.
Nominal Frequency	50/60Hz			
Automatic Switch Time	≤10ms			
THDv (Linear Load)	<3%			
<b>General Data</b>				
PV To AC Max. Efficiency	97.60%			
Euro Efficiency	97%			
PV MPPT Efficiency	99.90%			
Ingress Protection	IP65			
Protective Class	Class I			
Noise Emission (Typical)	<30dB			
Operating Temperature Tange	-20~+60 C			
Cooling	Nature			
Relative Humidity	0~100%, Non-condensing			
Max. Altitude	4000m (Derating Above 2000 m)			
Dimensions (WxHxD)	480×560×210(mm)			
Weight	30kg			
Topology	Transformerless			
Interface	Communication With Meter--Pluggable Connector Communication With Portal--Wi-Fi(USB)or LAN			
Monitoring	WIFI/LAN/4C(Optional)			
Display LCD	LED/LCD+APP			
Certificates	CE, UKCA, NTS2.1, UNE217001, UNE 217, NRS097, G98, G99, EN50549, C10/11, VDE-N4105, NTS2.1, UNE217001, AS4777.2			
Warranty	5 Year			



LV BATTERY

## ALPS Cube Pro LV Battery

 Long life LiFePO4 cell.

 Max. parallel 5 pcs, 25.6kWh.

 6000+ cycles support.

 Wall or floor mounting.

 Self-developed BMS, intelligent ensure the safe battery working.

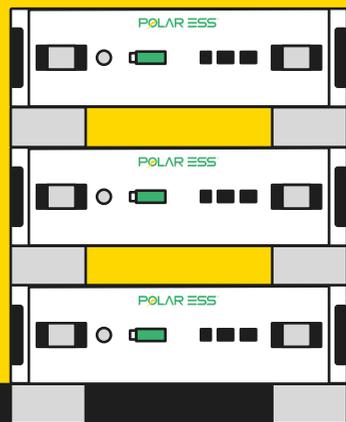
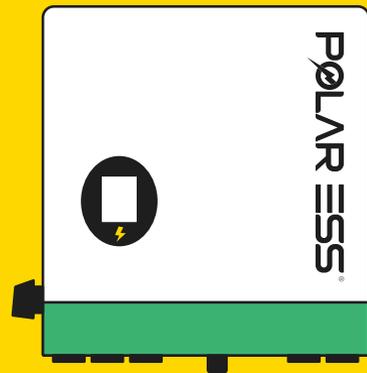
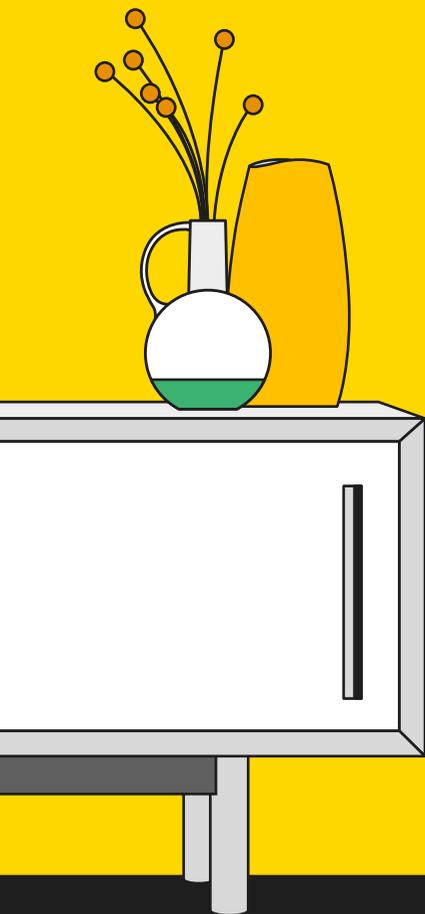
 IP65 sleek shiny design.

Model	ALPS Cube BA5.2
<b>Battery Moudles</b>	
Cell Type	LFP
Battery Energy	5.12kWh
Cell Capacity	100Ah
Nominal Voltage	51.2V
Battery Module Voltage Range	44.8-57.6V (Cell 2.8-3.6V)
Nominal Current	60A
Maximum Continuous Charging And Discharging Current	100A/100A
Cycle Life <sup>1</sup>	6000
DOD(Depth of Discharge)	93%
<b>General Data</b>	
Dimensions(WxHxD)	480x338x242(mm)
Weight	48±2kg
Charging Temperature	-0 ~ 55°C
Discharging Temperature	-10 ~ 55°C
Storage Hunidity	5-95% RH
Cooling	Natural
Parallel Quantity	5
BMS Communication	CAN/RS485
Installation	Rack Mounted / Ground Mounted
Ingress Protection	IP65(Battery & Electricity)
Certification	CE, UN38.3, MSDS, IEC 62619, UKCA, SABS EMC CoC
Warranty	5 Year

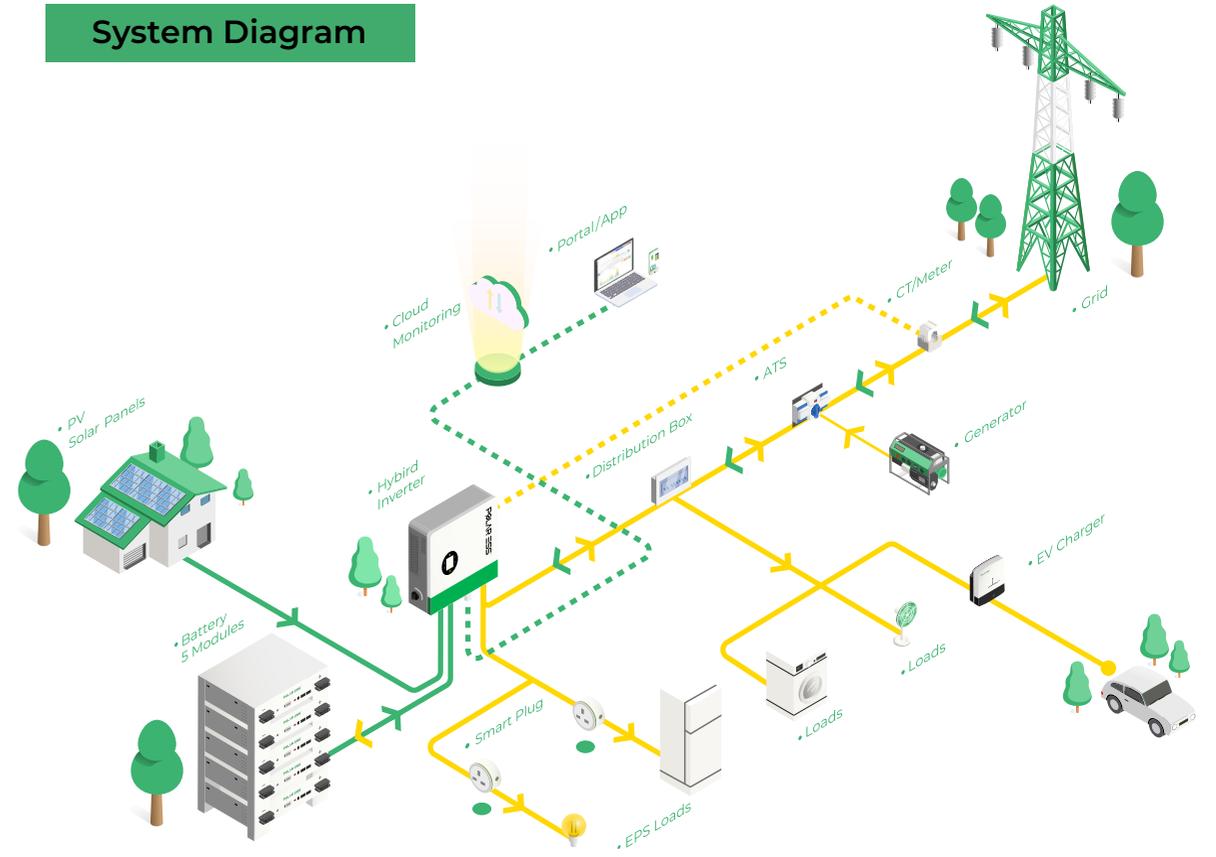
Remarks\*1: Test condition at 25°C±2°C,0.5C/0.5C,90%DOD



# Single Phase AIPS Energy Storage System



## System Diagram



### Whole-Home Backup

Provides uninterrupted power to your entire home during grid outages, keeping all essential systems and appliances running smoothly.



### Smart Fan

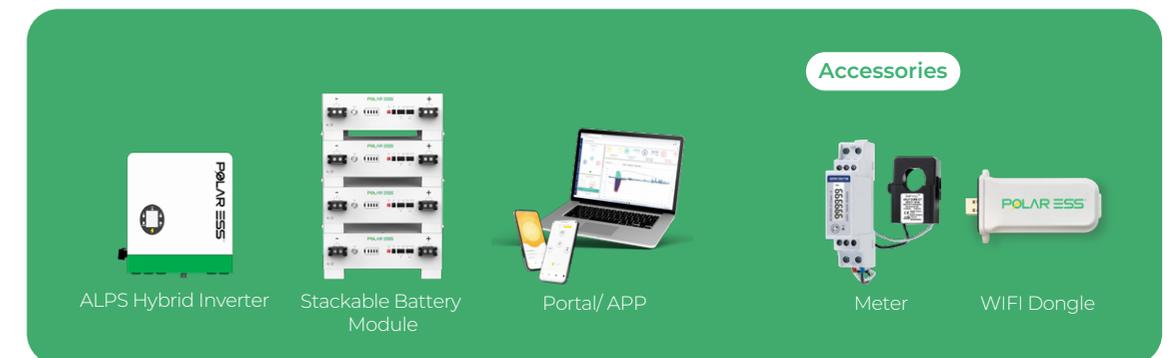
Automatically adjusts fan speed based on system conditions, ensuring quieter and more efficient performance.



### Control Your Energy

Seamlessly monitor and automatically manage your inverter, solar panels, batteries, loads, etc. with the Polar ESS App.

## System Components





HYBRID INVERTER

## ALPS Hybrid Inverter 3.6/4.6/5.0/6.0/8.0KW

2 MPPTs, with max.12kW PV input.

8kW AC output, with on/off grid, 2 times overload ability (10s).

LCD with switch, and advanced cloud platform.

Diesel generator access support, intelligent SOC control.

6 units in parallel, on/off-grid synchronous application.

< 10ms seamless automatic switch time.

Model	ALPS HY3.6-GL	ALPS HY4.6-GL	ALPS HY5.0-GL	ALPS HY6.0-GL	ALPS HY8.0-GL
<b>Input Data (PV)</b>					
Max. PV Input Power	5400W	7000W	7500W	9000W	12000W
Start-up Voltage	90V				
Max. PV Open-circuit Voltage	550V				
MPPT Voltage Range	90V-530V				
Rated MPPT Voltage	360V		380V		
Max. PV Short-circuit Current	23A/23A				
Max. PV Input Current	17A/17A		20A/20A		
MPPT Tracker/ No. of Strings Per MPPT Tracker	2 / 1				
<b>Battery</b>					
Battery Type	Li-ion/Lead-acid				
Battery Voltage Range	46.7-57.6V				
Nominal Voltage	51.2V				
Max. Charging/Discharging Current	83A/83A	104A/104A	112A/112A	130A/130A	175A/175A
Max. Charging/Discharging Power	4000W/4000W	5000W/5000W	5400W/5400W	6500W/6500W	8500W/8800W
Battery Communication	RS485 / CAN				
<b>Output Data(AC, On-grid)</b>					
Rated/Max. AC Output Power	3600W	4600W	5000W	6000W	8000W
Max. Apparent Power	3600VA	4600VA	5000VA	6000VA	8000VA
Rated/Max. Current	16Aa.c.	20Aa.c.	21.7Aa.c.	26Aa.c.	34Aa.c.
Nominal Grid Voltage/Range	230V.a.c / 180--270V.a.c				
Nominal Frequency/Range	50Hz/60Hz;±5Hz				
Power Factor(@Full Load)	>0.99				
Power Factor Adjustable Range	0.8 Lagging - 0.8 Leading				0.85 Lagging - 0.85 Leading
THDI (@Rated Power)	<3%				
AC Output Type	Single phase:L+N+PE				
<b>Output Data(AC, Back-up)</b>					
Nominal EPS Output Power	3600W	4600W	5000W	6000W	8000W
EPS Peak Power (10s)	7200VA	9200VA	10000VA	12000VA	12000VA
AC Nominal Voltage	230V.a.c.				
Rated/Max. Output Current	16Aa.c.	20Aa.c.	21.7Aa.c.	26Aa.c.	34Aa.c.
Nominal Frequency	50/60 Hz				
Automatic Switch Time	≤10ms				
THDv (Linear Load)	<3%				
<b>General Data</b>					
Battery Max. Charging/ Discharging Efficiency	94% / 94%				
PV To AC Max. Efficiency	97.00%				
Euro Efficiency	96.5%				
PV MPPT Efficiency	99.90%				
Ingress Protection	IP20				
Protective Class	Class I				
Overvoltage Category	PV: II, Battery: II, AC: III				
Cooling	Forced Air Cooling				
Noise Emission (Typical)	<45dB				<58dB(@1m)
Operating Temperature Range	-20~+60 C				
Full load Operation Temperature	-20~+45 C				
Relative Humidity	0~100%, Non-condensing				
Max. Altitude	4000m ( Derating above 2000m)				
Dimensions (WxHxD)	455*425*190(mm)				
Weight	22kg				24.7kg
Self-consumption	≤10W				
Display	LCD/LED+APP				
Interface	Communication with Meter - Pluggable Connector Communication with Portal - Wi-Fi (USB)				
Certificates	CE, UKCA, G98, G99, NRS097, EN50549, C10/11, VDE-N4105, NTS2.1, UNE217001, AS4777.2				
Warranty	3 Year				



# APLS LV BATTERY

## ALPS LV Battery

Long life LiFePO4 cell.

Max. parallel 5 PCS, 25.6kWh.

6000+ cycles support.

Wall or floor mounting.

Self-developed BMS, intelligent ensure the safe battery working.

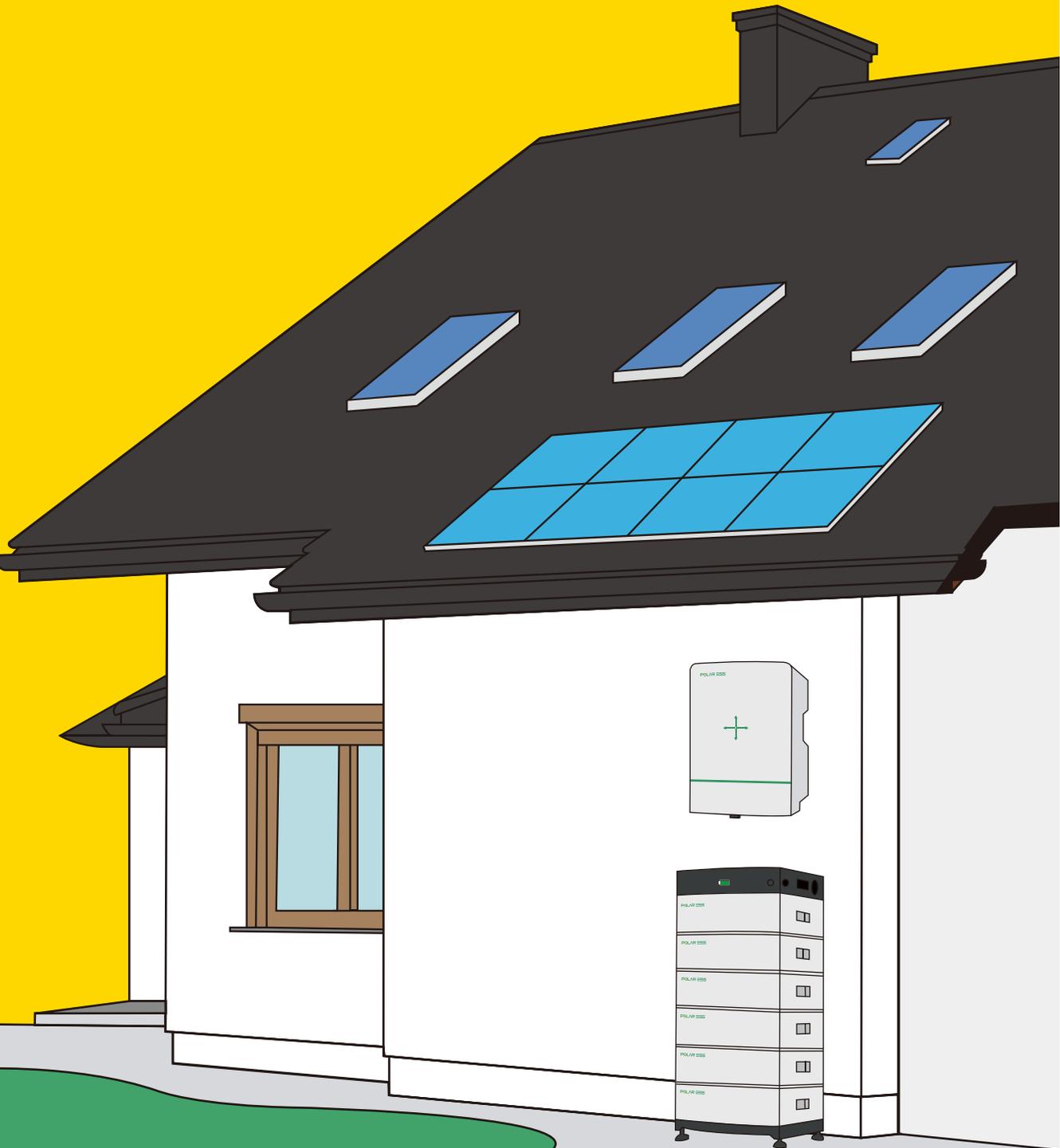
Mainstream inverter matching support.

Model	ALPS BA5.2
<b>Battery Modules</b>	
Cell Type	LFP
Battery Energy	5.12kWh
Cell Capacity	100Ah
Nominal Voltage	51.2V
Nominal Current	100A
Maximum Continuous Charging And Discharging Current	100A/100A
Cycle Life <sup>1</sup>	6000
DOD(depth Of Discharge)	93%
<b>General Data</b>	
Dimensions(WxHxD)	505x480x134(mm)
Weight	46±2kg
Charging Temperature	-0 ~ 55 C
Discharging Temperature	-10 ~ 55 C
Storage Temperature	46 C ~ 55 C @7day SOC≥30% 36 C ~ 45 C @6months SOC≥30% -20 C ~ 35 C @1year SOC≥50% (Perform Maintenance Every 6 Months)
Storage Humidity	5-95% RH
Maximum Operating Altitude	2000m (Derating Above 2000 m)
Cooling	Natural
BMS Communication	CAN/RS485
Installation	Rack Mounted / Ground Mounted
Ingress Protection	IP20(battery & Electricity)
PACK Certification	CE, UN38.3, MSDS, IEC 62619, UKCA, SABS EMC CoC
Warranty	5 Year

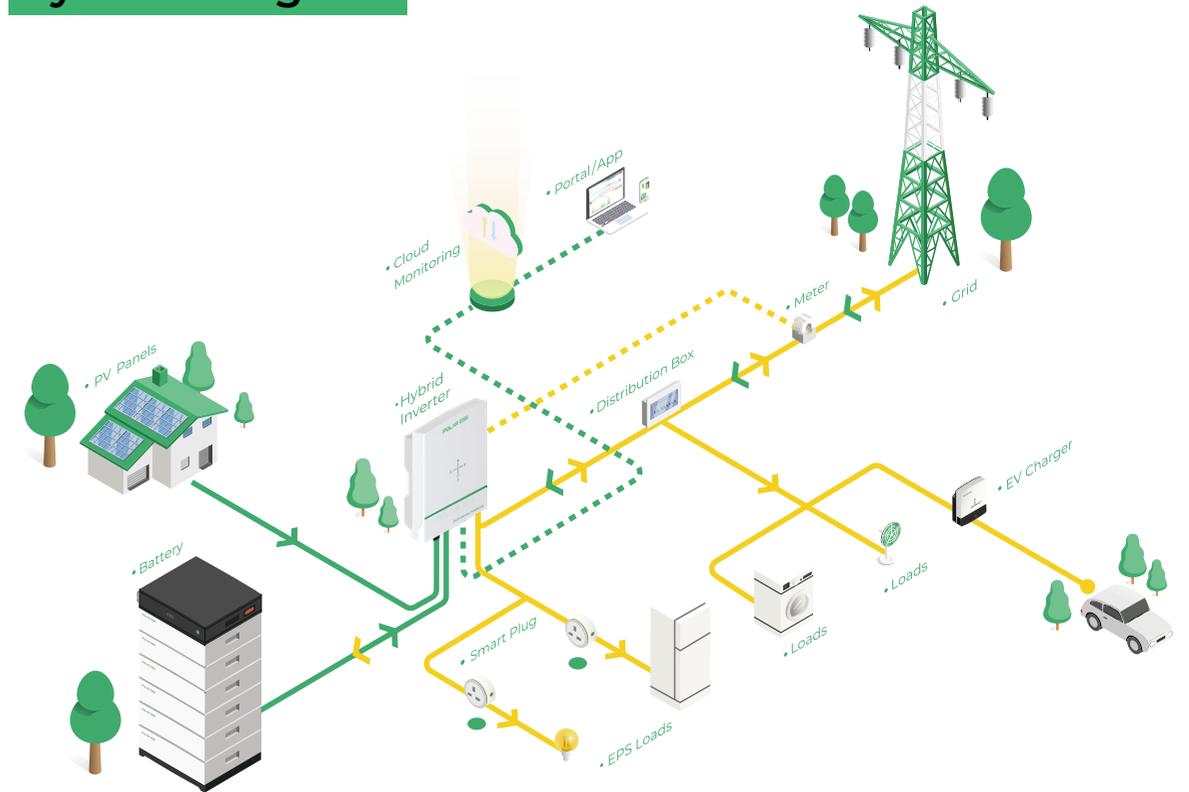
Remarks<sup>1</sup>: Test condition at 25 C ±2 C, 0.5C/0.5C, 90%DOD



# Three Phase Energy Storage System



## System Diagram



### Stability

100% unbalanced load application, resilient to power fluctuations, ensuring smooth operation.



### High Power & Scalability

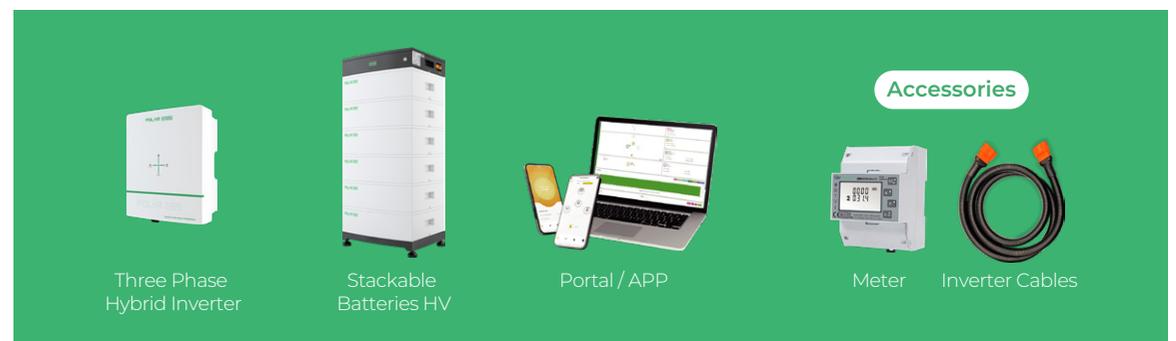
Maximum single-unit output power of 20kW, with the ability to connect up to 6 units in parallel, alleviating concerns for small-scale commercial electricity use.



### Save on Energy Costs

Each unit can be paired with a maximum 80kWh battery, fully utilizing PV and battery power to reduce grid electricity bills.

## System Components



Three Phase Hybrid Inverter

Stackable Batteries HV

Portal / APP

Meter

Inverter Cables



# HYBRID INVERTER

## Three Phase Hybrid Inverter 6.0/8.0/10.0/11.0/15.0/20.0KW

2 MPPTs, with max. 30kW PV input.

20kW AC output, with on/off Grid.

LED simple display, and advanced cloud platform.

100% unbalanced load support.

Die casting integrated molding IP65 design.

10 section battery charging and discharging settings, free deployment.

Model	POL-3HY-6.0-HV	POL-3HY-8.0-HV	POL-3HY-10.0-HV	POL-3HY-11.0-HV	POL-3HY-15.0-HV	POL-3HY-20.0-HV
<b>Input Data(PV)</b>						
Max. DC Input Power	9000W	12000W	15000W	15000W	22500W	30000W
Start-up Voltage	200V					
Max. PV Open-circuit Voltage	1000V					
MPPT voltage range	200V - 850V					
Rated MPPT Voltage	600V					
Max. PV Short-circuit Current	20A			37.5A		
Max. PV Input Current	15A			30A		
MPPT Tracker / No. Of Strings Per MPPT Tracker	2/1			2/2		
<b>Output Data(AC, On-grid)</b>						
Rated/Max. AC Output Power	6000W	8000W	10000W	11000W	15000W	20000W
Max. Apparent Power	6000VA	8000VA	10000VA	11000VA	15000VA	20000VA
Rated/Max. Current	8.7A	11.6A	14.5A	15.9A	21.7A	29A
Nominal Grid Voltage/Range	230/400V.a.c					
Nominal Frequency/Range	50/60 Hz; ±5Hz					
Power Factor(@Full Load)	>0.99					
Power Factor Adjustable Range	0.8Lagging-0.8Leading					
THDi (@Rate Power)	3%					
AC Output Type	Three Phase; 3L/N/PE					
<b>Battery</b>						
Battery Type	Li-ion or Lead Acid					
Battery Voltage Range	200-600V			200-800V		
Nominal Voltage	450V					
Max. Charge / Discharge Current	25A / 25A			50A / 50A		
Max. Battery Charging/ Discharging Power	6000W/6000W	8000W/8000W	10000W / 10000W	11000W/11000W	15000W / 15000W	20000W / 20000W
Battery Communication	CAN					
<b>Output Data (AC, Backup)</b>						
Nominal EPS Output Power	6000W	8000W	10000W	11000W	15000W	20000W
AC Nominal Voltage	230/400V.a.c,					
Rated/Max. Output Current	8.7A	11.6A	14.5A	15.9A	21.7A	29A
Nominal Frequency	50/60 Hz					
Automatic Switch Time	≤10ms					
THDv(Linear load)	<3%					
<b>General Data</b>						
Battery Max. Charging/ Discharging Efficiency	97.5%/97%			98%/97.8%		
PV To AC max. Efficiency	97.9%			98.5%		
Euro Efficiency	97%					
PV MPPT Efficiency	99.9%					
Ingress Protection	IP65					
Noise Emission (Typical)	<30dB			<55dB		
Operating Temperature Range	-25~+60 °C					
Relative Humidity	0~100%, Non-condensing					
Smart Fan Cooling	Natural					
Max. Altitude	4000m(Derating Above 2000 m)					
Dimensions (WxHxD)	480x658x214(mm)					
Weight	35kg			40kg		
Max. parallel units	NO			6		
Self-consumption	<15W					
Protective Class	Class I					
Overvoltage Category	PV: II, Battery: II, AC: III					
Topology	Transformer-less					
Display	LED&APP					
Interface	RS485*2 For Meter And EMS; CAN For Battery BMS; WiFi/LAN For Remote Monitoring					
Certificates	CE, UKCA, G98, G98-NI, G99, EN50549, C10/11, VDE-N4105, NTS2.1, AS4777.2, IK10, PSE-2018, NRS097				CE, UKCA, G98, G98-NI, G99, EN50549, C10/11, VDE-N4105, NTS2.1, AS4777.2, IK10, PSE-2018, NRS097, IEC 62109, AS60947	
Warranty	5 Year					

# STACKABLE BATTERIES



## HV Stackable Batteries 10.2/13.6/17.0/20.4kWh

 Long life LiFePO4 cell.

 Up to 6 stackable.

 6000+ cycles support.

 High efficient operation.

 Intelligent self-developed BMS, ensure the safe battery working.

 IP65 sleek shiny design.

Model	POL-BAT-10.2-HV	POL-BAT-13.6-HV	POL-BAT-17.0-HV	POL-BAT-20.4-HV
<b>Integral Module</b>				
Battery Energy	11981Wh	15974Wh	19968Wh	23962kWh
Usable Energy	10200Wh	13600Wh	17000Wh	20400Wh
Nominal Voltage	230Vdc	307Vdc	384Vdc	460Vdc
Nominal Current	25A			
Maximum Continuous Charging And Discharging Current	25A/25A			
Maximum Power	5750W / 5750W	7675W / 7675W	9600W / 9600W	11500W / 11250W
Cycle Life <sup>1</sup>	6000			
<b>General Data</b>				
Dimensions(WxHxD)	480x650x380(mm)	480x800x380(mm)	480x950x380(mm)	480x1100x380(mm)
Weight	121kg	156.5kg	192kg	227.5kg
Charging Temperature	-0 ~ 55 C			
Discharging Temperature	-10 ~ 55 C			
Storage Temperature	46 C ~ 55 C @7day SOC≥30% 36 C ~ 45 C @6months SOC≥30% -20 C ~ 35 C @1year SOC≥50% (Perform Maintenance Every 6 Months)			
Storage Humidity	5-95% RH			
Maximum Operating Altitude	2000m (Derating Above 2000 m)			
Cooling	Natural			
Parallel Quantity	4			
Protective Class	Class I			
Installation	Wall Mounted / Ground Mounted			
Ingress Protection	IP65(Battery & Electricity)			
Display	LED			
PACK Certification	CE, UN38.3, MSDS, IEC61000, IEC 62619, VDE2510-50			
Warranty	5 Year			

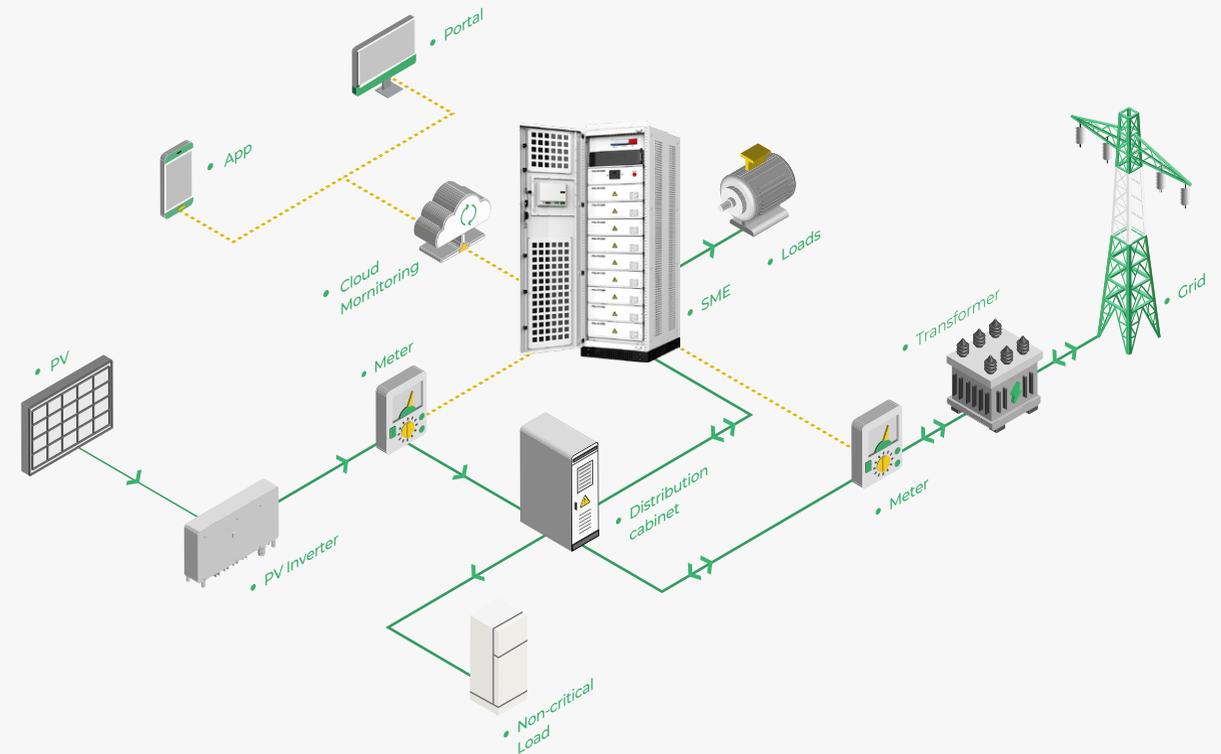
Remarks<sup>1</sup>: Test condition at 25 C ±2 C, 0.5C/0.5C, 90%DOD



# Commercial & Industrial Energy Storage System



## System Diagram



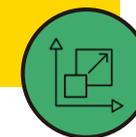
The PCS, battery pack, BMS, EMS, air conditioning, and fire protection are within a compact cabinet.

**All-in-one Integration**



Allows for flexible system scale expansion through the parallel use of multiple machines.

**Modular Design**



Factory pre-assembly enhances system integration, simplifying transportation and deployment on site.

**Easy to Install & Operate**





COMMERCIAL ESS

## SME Commercial ESS | 69kWh

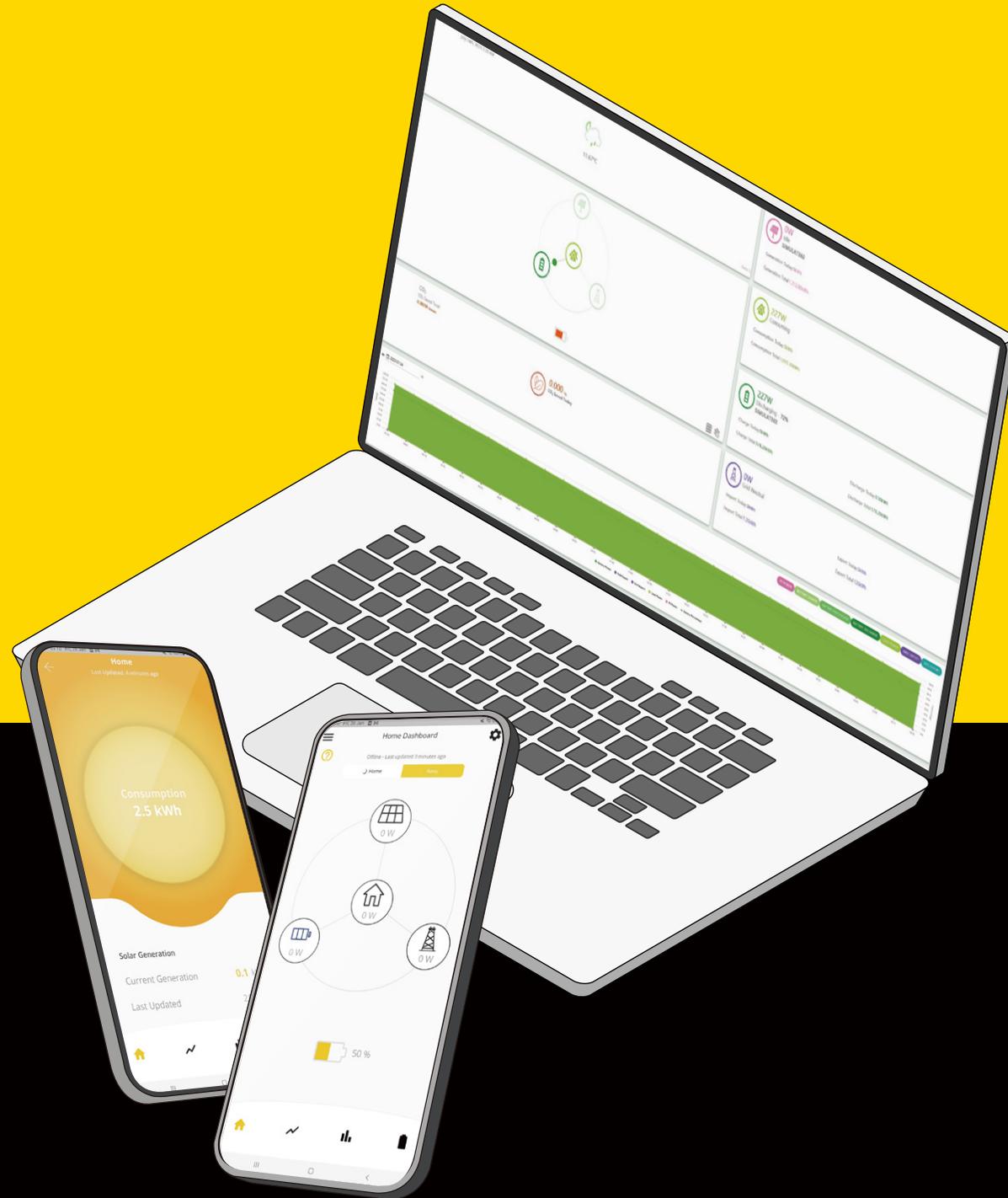
A battery and PCS combined – unrivalled for power and price point.

With the Commercial ESS, you can power your small to medium sized enterprise even the highest demand loads with maximum efficiency, minimum energy costs. It's suitable for various industrial parks, malls, hotels, hospitals, etc.

Model	Polar-SME-30/64-ID	Polar-SME-50/64-ID
<b>Battery</b>		
Battery Type	LFP 3.2V/100Ah	
Battery Pack Configuration	1P24S	
Battery Module Connection	1P216S	
Rated Voltage	691.2V	
Voltage Range	580-788.4V	
Battery Module Qty	9	
System Capacity	69.12kWh	
Usable Capacity	64kWh	
<b>AC Output</b>		
Rated Power	30kW	50kW
Max. Output Power	33kW	60kW
THDi	≤3% (Rated Power)	
Rated Grid Voltage	400V	
Voltage Range	360-440V	
AC Connection	3P+N+PE	
Rated Frequency	50Hz/60Hz	
Adjustable Power Factor	1 Lagging - 1 Leading	
<b>Protection</b>		
DC Reverse Polarity Protection	Yes	
Output Over Current Protection	Yes	
Output Over Voltage Protection	Yes	
Short Circuit Protection	Yes	
Surge Protection	Level 2	
High and Low Voltage Ride-through	Yes	
<b>Communication</b>		
Communication Interfaces	RS485/CAN/Ethernet	
Human Machine Interface	Touchscreen	
<b>General Data</b>		
Charge/Discharge Rate	0.5C	1C
Depth of Discharge	90%	
Battery Cycle Life	≥6000	≥4000
Topology	Transformerless	
Max. Efficiency	≥90%	≥89%
Protection Class	IP20	
Cooling Method	Fan Cooling	
Communication Protocol	CAN/RS485/LAN	
Operating Temperature	0°C-55°C	
Noise Emission	<70dB	
Humidity	0~95% (No Condensation)	
Dimension (W×D×H)	600×800×2000(mm)	600×800×2160(mm)
Weight	850kg	880kg

# Monitoring Cloud Platform

Big on control, smart on energy.



## The Portal.

Your portal hosts the full details of your energy data. It's for detailed management **and monitoring.**



Remotely manage your system in the cloud with total control.

Get clicky with our clean, easy-to-use interface.

Get up close and personal with your data with up-to-the-minute visibility, and granular insights.

For online portal access, please visit:  
<https://cloud.polar-ess.co.uk>

## The App.

Your app is lighter and designed to keep **you connected on the go.**

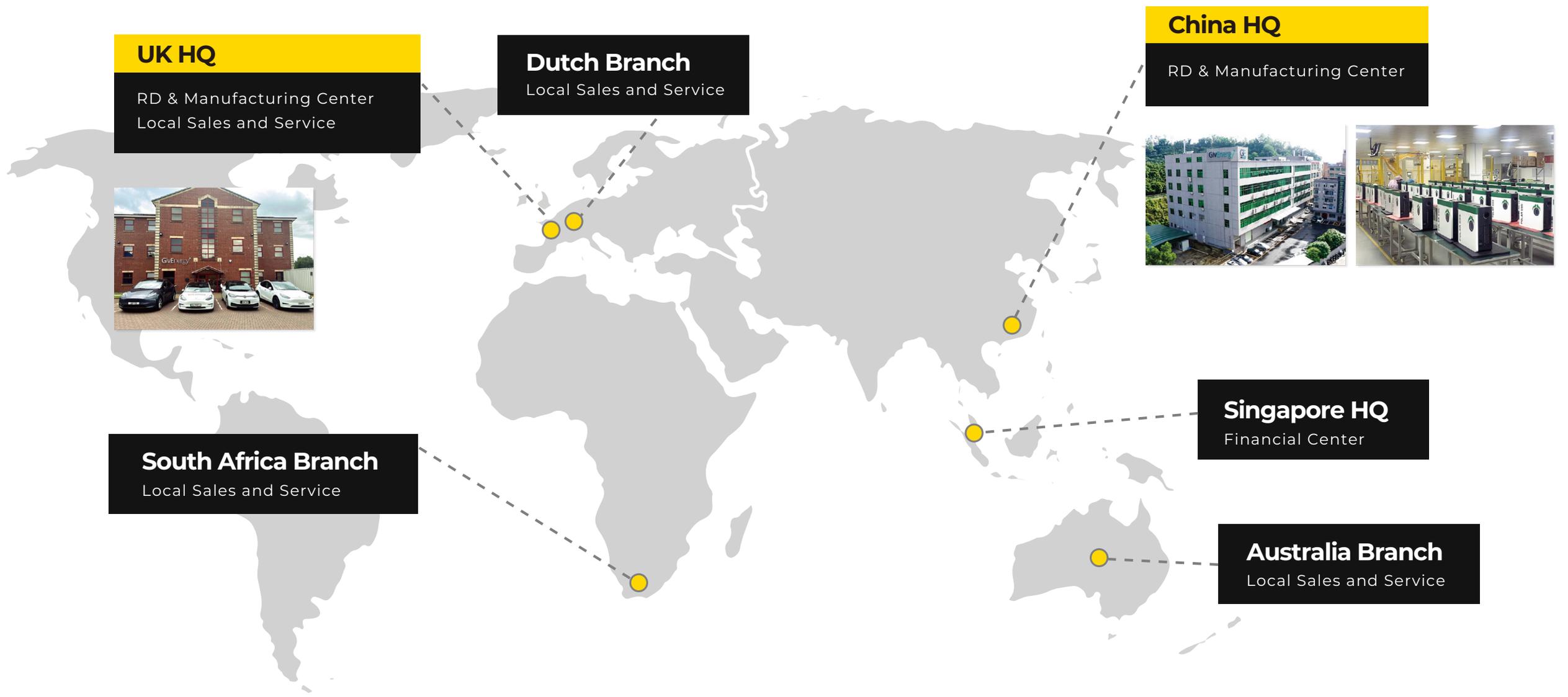


Grab all the prime, headline info on import, export, generation, demand, and battery status.

Make any ad-hoc changes you need, based on where the day is taking you.

Download completely free from Google Play or the App Store.

# Global Reach, Local Expertise



## R&D Strength

### Polar ESS has two dedicated R&D teams

One in the UK and one in China, focusing on developing diverse software and hardware products.

**1 UK R&D**

- Portal
- APP

**2 China R&D**

- 3S (PCS, BMS, EMS), Inverters, Lithium Batteries
- Residential & Commercial Solutions



# Localized Manufacturing

## Polar ESS operates two factories.



**The China factory**, covering an area of 15,000 m<sup>2</sup>, produces battery packs, inverters, and commercial battery systems. It has a production capacity of 300,000 units/year and a lithium battery production capacity of 1 GWh/year. This factory is equipped with automated assembly workshops, an automated cell pack line, and an automated packing line.



**The UK factory** primarily manufactures EV chargers and commercial energy storage systems. It includes a custom-built R&D lab for repairing, recycling, and reusing damaged and old battery systems.

Automated Assembly Workshops



Automated Packing Line



Automated Cell Pack Line

