



## High Performance

- 20,000+ cycles
- Charge/Discharge up to 1C
- Yearly degradation <0.6% @ 25°C
- Titanium battery chemistry

## ESS Applications

- Peak shifting
- Smart-grid and Micro-grid
- Maximize generation profitability

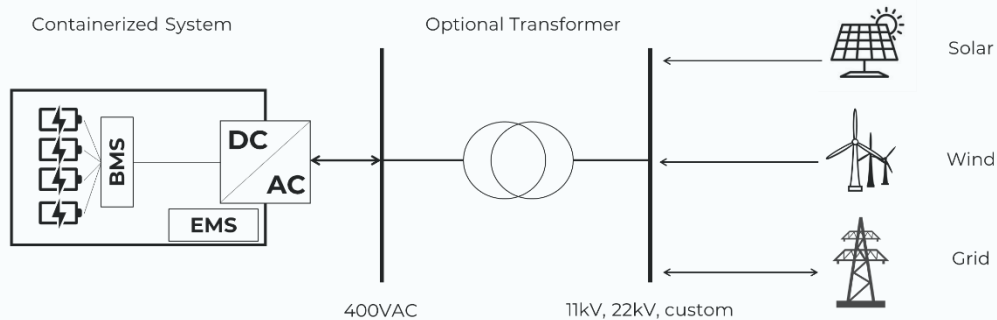
## Simple O&M

- World-class BMS monitoring
- Open EMS protocol for integration
- Flexible and fixed warranty options

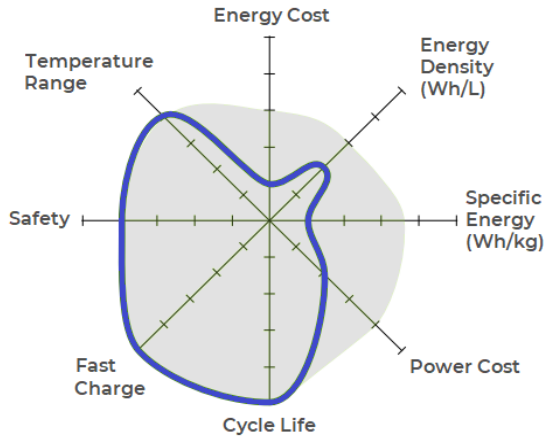
## Grid Support

- IEC grid compliance
- Fast charging/discharging
- (Optional) Off-grid capability

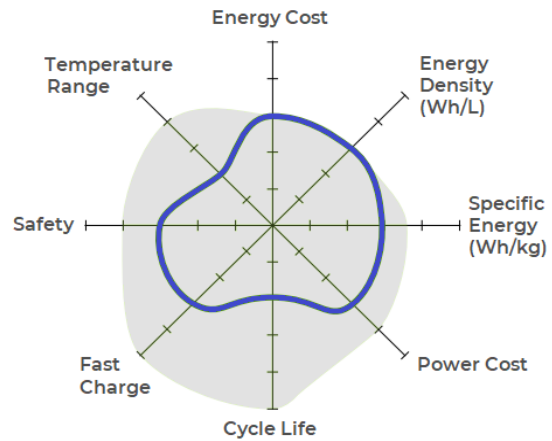
## Connection Diagram



## ZENON™ ESS



## Competitor ESS



## DESCRIPTION

The Zenon ESS™ system is a modern energy storage system with a lifetime matching that of solar.

Specifically designed to overcome the current issues of lithium storage, this system can reliably cycle for decades with little capacity fade, sulphation, overheating, memory effect, short lifetime, fire risk, and other common battery issues such as BMS overheating and reliability issues.

	Lead Acid / Gel / AGM	Lithium Phosphate	NMC Lithium	Flow Battery	<b>ZENON SYSTEM</b>
Cyclelife 25°C	1,500	3,000	3,200	10,000	<b>&gt; 20,000</b>
Cyclelife 45°C	500	1,000	1,200	10,000	<b>&gt; 6,000</b>
Typical Yearly Degradation	3%	6%	4.4%	6%	<b>0.6%</b>
Usable lifetime (realistic)	< 4 years	< 8 years	< 8 years	< 20 years	<b>&lt; 25 years</b>
Warrantied kWh cost	Up to 3 year	10 year, 40% loss	8 year, 30% loss	10 year, 0% loss	<b>Up to 20 year, 30% loss</b>
LCOE*	\$0.16/kWh	\$0.13/kWh	\$0.19/kWh	\$0.34/kWh	<b>\$0.082/kWh</b>

\*LCOE calculation based on a 10MWh system size and varies from region to region.

## TECHNICAL SPECIFICATIONS

		ZESS-400
BATTERY SPECS	CHEMISTRY	Titanium Superconductor
	DC SPECIFICATION	500V / 800Ah bank 400kWh @ 100% DoD / 0.2C discharge
	MAX POWER	50kW 0.2C pulse (5s)
	ROUNDTRIP EFFICIENCY	<97% at 1C
	CYCLE LIFE	22,000+
	CYCLE/FLOAT VOLTAGE	590V / 580V
	TEMPERATURE DERATING	85% capacity @ -10°C 90% capacity @ 0°C 100% capacity @ 25°C
BMS / EMS SYSTEM	BALANCING TYPE	Active balancing (15A @ 93% eff.)
	MONITORING	Full online monitoring platform with alerts
	FEATURES	OTA Updates
	INTERFACE	WiFi, RS485, USB, Ethernet
	EMS PROTOCOL	Growatt Automatic EMS
OPERATING ENVIRONMENT	WORKING TEMPERATURE	- 30 °C to +50 °C (derating above 40°C)
	STORAGE SOC	40-70%
	STORAGE TEMP.	- 5°C to + 30°C
SAFETY	CELL SAFETY TESTS	Overdischarge/ Overcharge/ Short circuit/ 1.5m Droptest/ Heattest 130°C/ Stress test cycling/ Crush tests of 200kN/ Puncture tests/ Salt water immersion/ Low pressure test
	CERTIFICATION	UN38.3, IEC/EN 62133 planned, VDE 4105, VDE0126
OTHER	DESIGN LIFETIME	Max. 30 years / 30,000 cycles
	CONTAINER SPECIFICATION	20' CONTAINERIZED



Live component-level monitoring on all our systems is possible with our proprietary IoT BMS platform.

- System logs, alarms, and alerts
- Data-driven battery warranty up to 20 years
- Historic records from 5 minutes to 5 years
- Direct communication with the system using the leading SunSpec protocol.

**STANDARD**
**LI-ION / LIFEPO4**

- 10 years
- 2.2MWh
- 60% capacity


**POWERFUL WARRANTY**
**10-YR**
**SUPERTITAN**

- 10 years
- 5.5MWh
- 90% capacity

**15-YR**
**EXTENSION 1**

- 15 years
- 7.3MWh
- 80% capacity

**20-YR**
**EXTENSION 2**

- 20 years
- 9.1MWh
- 70% capacity


**ZENON NETWORK**


Our manufacturing and installer network has over 14 years' experience in containerized storage.

Please contact us for a list of references.