

## Specifications for LiGE 1MWh Compressed Air Energy Storage (CAES) 'Air Battery'

<b>SPECIFICATION</b>	<b>DEFINITION</b>	<b>VALUE</b>
System type	Compressed Air Energy Storage Adiabatic method with heat storage.	
Rated Continuous Discharge Power	The rate at which the CAES can continuously deliver energy. Storage component's entire specified state of storage (SOS) range.	20 - 250kW
Capacity / Useable power	Amount of usable power available	1000kWh
Rated Apparent Power – AC systems	The real or reactive power (leading or lagging) that the CAES can provide into the AC grid continuously without exceeding the maximum operating temperature of the CAES system.	312.5kVA - AC 0.8 alpha
Rated Power – DC systems	DC systems only have power not reactive power.	N/A
Solar power	DC input with EDS protection	1000V DC 300A
Rated Continuous Charge Power	The rate at which the CAES can capture energy for the energy storage component's entire SOS range.	300kW
Rated Continuous Current	The current that the CAES can provide into the grid or load continuously and can be charged by the grid or other source eg. Solar, continuously without exceeding the maximum operating temperature of the CAES system.	450A 3-phase
Frequency	As per order	50/60Hz
Output Voltage Range	The range of AC grid voltage or load specified load voltage which the CAES will supply at, in accordance with the CAES specification.	230/250V

Total Response Time	The response time shall be measured in accordance with a chart provided starting when the signal (command) is received at the CAES boundary and continuing until the CAES discharge power output reaches $100 \pm 2\%$ of its rated power.	TBA subject to test
System Round Trip Efficiency	Total round-trip efficiency from beginning of life (BOL) to end of life (EOL), defined as the ratio of the delivered output energy of the energy storage system to the absorbed input energy required to restore it to the initial state of charge under specified conditions.	72% +/- 3%
Maximum CAES Pressure	Maximum rated pressure at which the CAES operates (at maximum SOS)	250 bar
Minimum CAES Pressure	Minimum rated pressure at which the CAES is still functional (at minimum SOS)	10 bar
Maximum Rated Receiver Pressure	The maximum pressure at which the manufacturer rates the air receiver. Should have a safety margin as specified in the OHS Act. ISO11120-X	275 bar
Ramp Rate	The maximum rate, expressed in megawatts per minute, that the CAES can change its input and output power. This may vary in multiple dimensions such as SOS and/or other parameters of the system that may be broken out into multiple line-item values.	10,000 kW/min
Enclosure Type	Steel container, purpose fitted for sub-components	12 metre
Equipment Footprint	Area required	32m <sup>2</sup>
Height	Equipment height plus safe clearance distances above the equipment as per the OHS Act.	2.5m + 0.5m
Weight	Total dry weight	10,000kg
Operational	Temperature range	-10 to +40 deg C
Operational	Relative humidity	10 to 90% non-condensing
Operational	Placement outside, in a basement, on a rooftop, on a level concrete pad with power reticulation points.	
Operational	Noise level	<= 60 dBA
Operational	Water output is dependent on the humidity of the air	Variable up to 5,000 litres per day

Grid Communication Standards/Protocols	ISO 11120: ISO 3744:2009; 61000-6-2:2005; sans 10142- 1; ISO 1217:2009;	AS/NZ standards apply to systems manufactured in Australia
Typical Recharge Time	With input power as per minimum rating	6 hours
Monitoring	GSM, digital radio, satellite where applicable. Basic dashboard for monitoring subject to monthly rental and Internet connection. Monitoring of every LiGE CAES System is compulsory. All Data belongs to LiGE	
Lifespan	CAES systems operational lifespan	30 years
Maintenance Costs	Maintenance costs are expected to be less than 1% of the purchase price over the lifespan of the unit,subject to environmental conditions.	Renewable maintenance agreements
Warranty and Replacement Schedule	Warranty inclusions and exclusions include replacement schedules, timespan of warranty and any limitations.	5 years on parts and unit, subject to maintenance agreement
Availability of System	Initial lead time to delivery of a system from confirmed order is expected to be between 8 to16 weeks. These lead times are expected to reduce as production ramps up.	

***Subject to change without notification.***