

# INVINITY VS3-022

## SIX PACK™ VANADIUM FLOW BATTERY

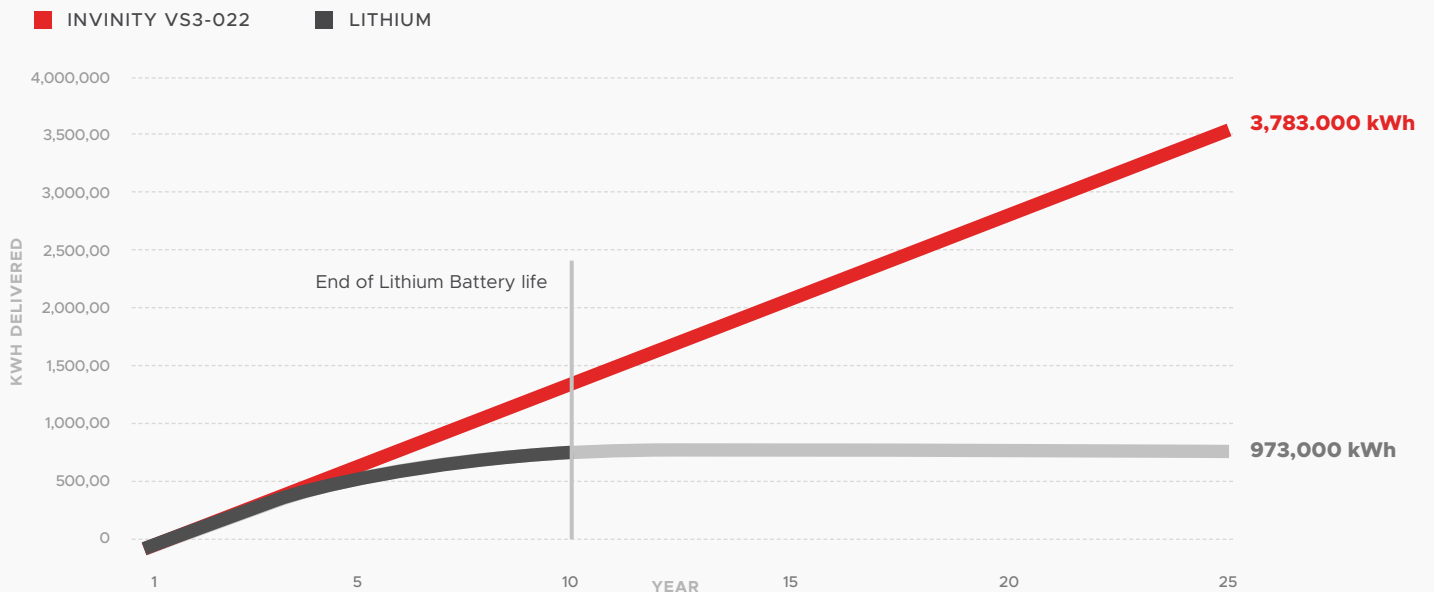


Invinity’s utility-grade energy storage is safe, economical and proven, lasting over 25 years.

The VS3-022 is a stationary energy storage system with industry-leading operational flexibility. It uses Invinity’s field-proven vanadium redox flow technology to store energy in an aqueous solution that never degrades, is non-flammable and requires little maintenance and upkeep. Incorporating redundant safety systems and true power-off, the VS3-022 provides exceptional personnel safety.

- Non-flammable
- 25 year lifespan
- Lowest LCOS
- Safe by design
- Unlimited cycles
- High recyclability

### CUMULATIVE ENERGY DELIVERED OVER TIME



Assumptions: 220 kWh DC capacity installed, 2 cycles per day, 100% DoD per cycle, 365 days a year

## PERFORMANCE SPECIFICATIONS

Nameplate Rating DC Voltage	1000 VDC
Operating Voltage, Nominal	850 VDC
Operating Voltage Range, Full Power	750 to 950 VDC
Max. Continuous DC Current	±104 A
Max. Continuous DC Power	78 kW
Energy Storage Capacity	220 kWh
Energy Storage Duration	2.5 hours @ 78 kW 4 hours @ 56 kW 8 hours @ 28 kW
Overcurrent Protection Device	Integrated
Max. Recommended Depth of Discharge	100%
Cycle Life	> 20,000 cycles
Lifetime Throughput	3,783 MWh
Annual Capacity Degradation	< 0.5% per year
Max. DC Round Trip Efficiency (RTE)	> 78%
Annual DC RTE Degradation	< 0.1% per year
Battery Management System, Fault Protection, DC Disconnect	Integrated
Third Party EMS Integration	Optional
Communications Interface	Modbus TCP
Auxiliary Input	External AC Supply
AC Auxiliary Supply	380-415 VAC, 3 $\Phi$ , 4 wire 50/60 Hz
Auxiliary Power, Nominal	3.6 kW
Auxiliary Power, Max.	7.8 kW

## ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature	25°F to 110°F (-5°C to 45°C)
Ambient Operating Temperature with Optional Configuration	-13°F to 110°F (-25°C to 45°C)
Cooling	Integrated, Forced Air
Operating Humidity	0 to 95% RH
Environment	Indoor & Outdoor
Enclosure Rating	NEMA 3R and IP 54
Maximum Elevation	11,480 ft (3,500 m)
Wet Location Rating	Yes
Additional Cooling Required	None
Fire Suppression System Required	None
Secondary Containment	Integrated

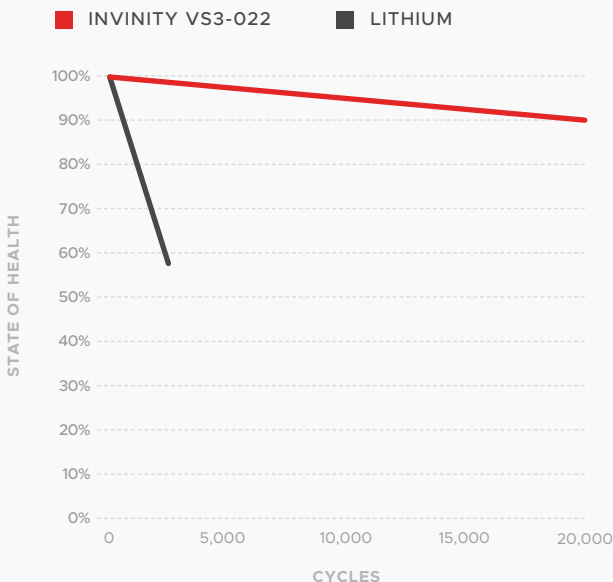
## STANDARD COMPLIANCE

Safety	UL 1973, CE, IEC 62932
Energy Storage Systems and Equipment	UL 9540

## PHYSICAL SPECIFICATIONS

Dimensions (L x W x H)	19.87 x 8.042 x 7.87 feet (6058 mm x 2438 mm x 2400 mm)
Weight (Flooded)	54,230 lbs (24,600 kg)
Mounting	Concrete pad mount or equivalent
Rec. Service Clearance (Long Sides)	59 inches (1500 mm)

## BATTERY CAPACITY AS A PERCENT OF ORIGINAL\*



\*Assumptions: No capacity augmentation



Siting underway. Double-stacked configuration shown