



WINNER[®]
BATTERY
SWITCH FOR SUCCESS
TITAN

Advanced lead-carbon batteries

The **new generation**
of lead batteries!



SUPERIOR TECHNOLOGY | RELIABILITY | SAFETY





WINNER TITAN.

The new generation of lead batteries! Advanced technology for large scale energy storage.

WINNER TITAN is a new generation of valve regulated lead acid battery with large capacity and ultra long deep cycle life, based on lead-carbon technology.

Built to fulfill your most demanding requirements, WINNER TITAN batteries will win the day in a variety of Energy Storage applications, including, smart-grid and micro-grid power plant, residential and autonomous energy storage.

WINNER TITAN Advanced Lead Acid batteries combine high energy density with high power and rapid charge and discharge, optimized to meet and exceed every energy storage challenge while increasing your flexibility and independency.

With consistency and reliability, Winner offers certified and tested products which comply with European and national performance and safety directives.

Single Cell Technical Parameters

WINNER TITAN 500 and WINER TITAN 1000

BATTERY TYPE		WINNER TITAN 500	WINNER TITAN 1000
Nominal voltage		2V	2V
Nominal capacity@25 °C		500Ah(C ₁₀)	1000Ah(C ₁₀)
Nominal capacity		1000Wh	2000Wh
Weight		41kg	75kg
Dimensions	H	508mm	508mm
	W	172mm	172mm
	L	166mm	303mm
Mass energy density		24Wh/kg	27Wh/kg
Volume energy density		69Wh/L	79Wh/L
Max. current	Charge	0.2C ₁₀ A	0.2C ₁₀ A
	Discharge	0.4C ₁₀ A	0.4C ₁₀ A
Cycle times (25 °C) 70%DOD		4200	4200
Design life (25 °C)		15 years	15 years





TECHNOLOGY.

- Advanced lead-carbon technology offering improved charge acceptance
- Enhanced cycle life even under PSOC condition
- More than 5200 cycles at 50% DOD
- More than 4200 cycles at 70% DOD
- Superior cell performance uniformity and reliability, ideal for large scale energy storage applications
- Special alloy, with carbon composite additives for high protection against PAM softening, grid corrosion and sulfation.
- Horizontal placement ability, mechanical elasticity
- Modular design, easy installation

RELIABILITY.

- Strict manufacturing standard and process control, uniformity control of raw materials and battery parts
- Proprietary acid filling and battery formation technology, to control the consistency of electrolyte density and quantity
- Hot-sealing technology of PP container and cover, integrated design of safety valve
- Advanced terminal welding technology, eliminating battery leakage
- Outstanding safety performance, with no fire risk when over-charging, and no need of extra protection circuit
- Large system equipped with BMU (Battery Monitoring Unit), monitoring SOC (State of Charge) and SOH (State of Health) of cells remotely and in real time

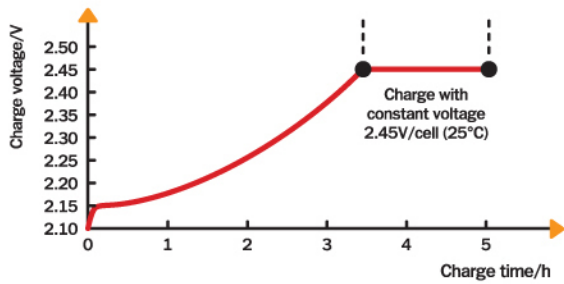
Module Technical Parameters

WINNER TITAN 500-12 and WINER TITAN 1000-12

BATTERY TYPE		WINNER TITAN 500-12	WINNER TITAN 1000-12	NOTE
Nominal voltage		12VDC	12VDC	
Nominal capacity@25°C		500Ah(C ₁₀)	1000Ah(C ₁₀)	10.8VDC 1.8V/cell
Weight		260kg	500kg	
Plastic container/cover		UL94V- 0	UL94V- 0	
Internal resistance		0.3mΩ/cell	0.2mΩ/cell	Reference value
Terminal type		M10	M10	
Temperature	Charge	0°C ~ 40°C	0°C ~ 40°C	
	Discharge	-15°C ~ 45°C	-15°C ~ 45°C	
	Storage	-15°C ~ 40°C	-15°C ~ 40°C	
Charge	Charge voltage	14.7VDC (2.45V/cell)	14.7VDC (2.45V/cell)	25°C
	Voltage range	15.4VDC ~ 14.2VDC	15.4VDC ~ 14.2VDC	0°C ~ 40°C
	Temperature coefficient	-30mV/°C	-30mV/°C	14.7V;25°C
Max. current	Charge	0.2C ₁₀ A	0.2C ₁₀ A	Continuous using
	Discharge	0.4C ₁₀ A	0.4C ₁₀ A	
Life	Cycle times	4200	4200	25°C, 70% DOD
	Service life	15 years	15 years	charge & discharge
Installation method		Horizontal	Horizontal	

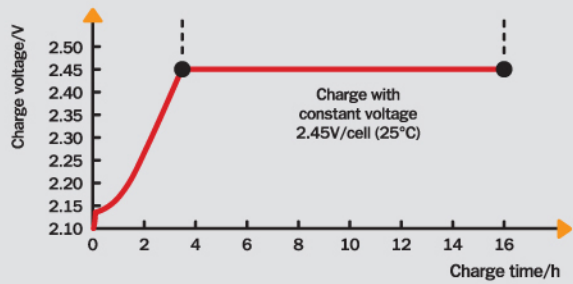
Charge method

Cycle charge curve



Note: The max. charge current should be controlled in $0.1C_{10} \sim 0.2C_{10}$.

Equalizing charge curve

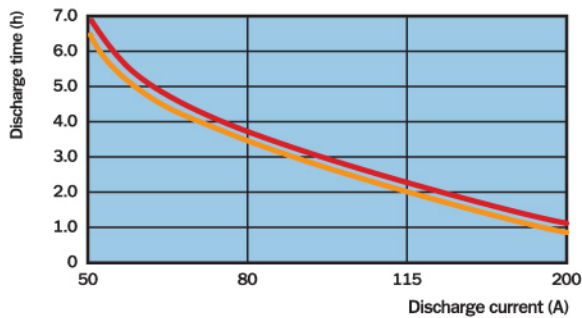


Note: The max. charge current should be controlled in $0.1C_{10} \sim 0.2C_{10}$, need regularly equalizing charge.

Discharge characteristics

WINNER TITAN 500

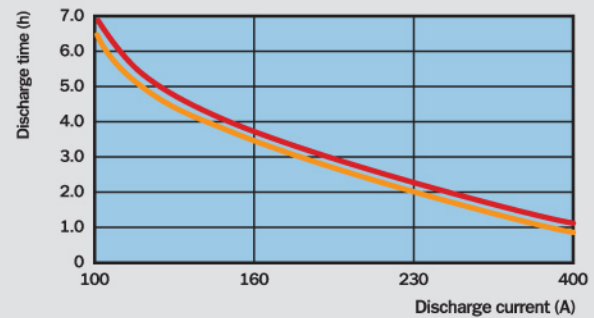
discharge current VS discharge time curve



Note: The best discharge current is 50A or lower, discharge time can reach above 7hours, maximum discharge depth is 70%.

WINNER TITAN 1000

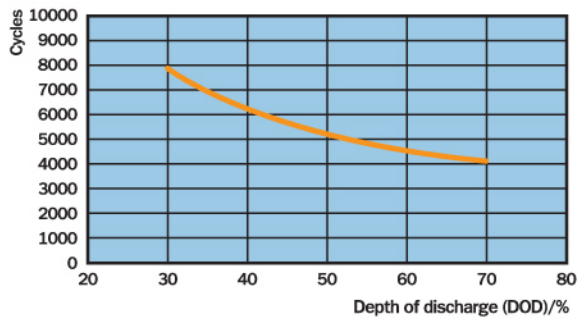
discharge current VS discharge time curve



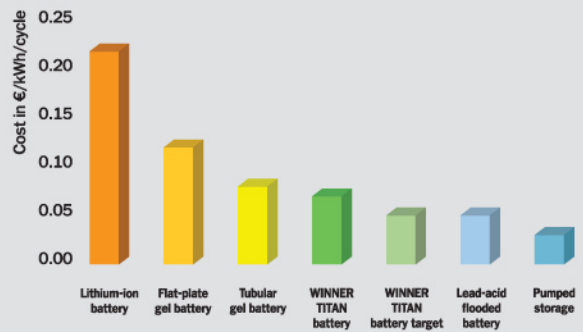
Note: The best discharge current is 100A or lower, discharge time can reach above 7hours, maximum discharge depth is 70%.

Cycle life

Depth of discharge VS cycle life



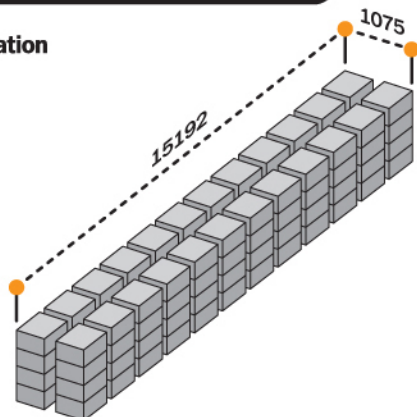
Cost per kWh and per cycle



Installation dimensions

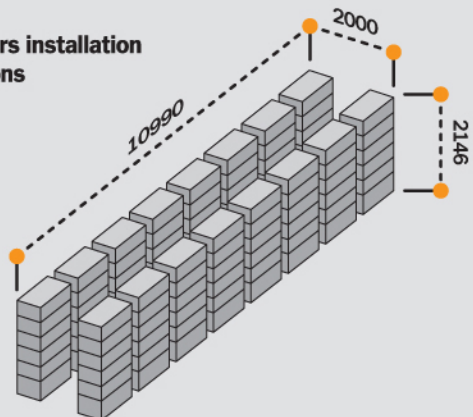
Indoor installation dimensions

(Unit: mm)



1.1 MWh energy storage system

Containers installation dimensions



6 layers, 8 lines and 2 rows (mm): 10990 * 2000 * 2146
Inner dimensions of 40-feet container (mm): 12010 * 2340 * 2690

Storing your Sun!

APPLICATIONS



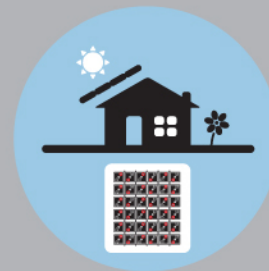
Micro-grid power plant



Smart-grid



Autonomous energy storage



Residential energy storage

COMPARISON OF DIFFERENT TECHNOLOGIES

Properties	WINNER TITAN lead-carbon	Lithium-ion Battery	Redox Flow Battery	Note
Cycle Life	●●●●●	●●●●○	●●●●●	WINNER TITAN has enhanced cycle life even under PSOC condition, overcoming the disadvantages of conventional lead acid battery
Installation Room	●●●○○	●●●●○	●○○○○	WINNER TITAN has modular design and installation, needing less space
Proportionality	●●●●●	●○○○○	●●●●●	WINNER TITAN does not need equalizing circuit. It only needs equalizing charge every 1-2 weeks till all cells reach the same SOC
Safety	●●●●●	●○○○○	●●●●●	WINNER TITAN has excellent safety performance, with no fire risk when over-charging, and no need of extra protection circuit
Cost	●●●●●	●●○○○	●○○○○	Compared with Lithium battery and Redox flow battery, WINNER TITAN has an excellent cost advantage
System Efficiency	●●●●○	●●●●●	●○○○○	WINNER TITAN with carbon composite adding, enhances the charging acceptance ability and increases remarkably the charging efficiency

Total Energy Solutions



Energy Storage & Distribution Solutions

WINNER is the global leader in energy storage and distribution solutions. With more than 800 product codes and presence in 40 countries, WINNER serves any application in Solar, Stationary, Starting and Traction fields since 1973.

WINNER batteries are known not only for their superior quality and unparalleled reliability but also for the capability to cover a wide range of applications under the "Total Solutions System". This unique system represents a 360° approach to meet any energy storage and distribution challenge.

WINNER in numbers

38	Product Series	1.450	Partners Worldwide
800+	Product Codes	40	Countries
80+	Applications	42	Years of Experience
13.600	Projects	100+	Employees in Europe
2+	Million kWh Total Capacity	130+	Car Brands
1.400+	Solar & Wind Energy Generating Sites	160+	Motorcycle Brands
		3	Quality Assurance Certifications

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