



Exclusively available from Trans Marine is Yttrium Iron Phosphate batteries which improve battery life, safety and thermal characteristics. Iron phosphate is one of the safest batteries in the Lithium battery family mainly due to a strong oxygen bond with phosphorous that reduces thermal runaways at high voltages. Yttrium a rare earth metal is known for its thermal characteristics, most often used on high performance spark plugs to reduce damage from heat and oxidation from elements under high temperature. Yttrium batteries operate at lower voltage of 4.0 volts max and have longer life than a LFP battery which operates as high as 4.2 volts and more prone to thermal runaways.

Yttrium batteries are ideal for storage and power applications such as electric vehicles. The key benefits of Yttrium batteries are high transfer efficiency at any state of charge, four time longer life cycle than lead acid batteries and no memory during charge or discharge cycle. These benefits are in addition to 33% weight and 50% volume when compared to lead acid battery, which means double the energy storage in the same space with lesser weight.

High transfer efficiency of up to 96% at any state of charge results in capturing 50% more energy from the solar panels, generators in RV's or chargers. In lead acid battery the published transfer efficiency is at 0% state of charge, as the battery charges the internal resistance increases dropping the transfer efficiency to 60% and the rest lost in heat generated by the battery. Since most lead acid applications involve shallow discharges, the transfer efficiency plays an important role

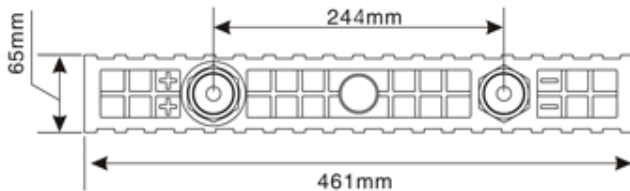
in amount of energy captured by solar panels, requiring additional investment in solar panels to achieve desired energy generation goals. Similarly a 3 kW diesel generator would have to run for longer period of times to charge lead acid batteries when compared to Yttrium batteries resulting in almost double the fuel consumption. These savings should be taken into account when performing cost benefit analysis between lead acid and Yttrium batteries.

Unlike lead acid batteries Yttrium batteries do not have any memory effect during charge and discharge cycles, therefore Yttrium battery can be cycled at any discharge rate for its entire life without any damage or reduction in life. Due to this characteristic of the chemistry of Yttrium battery life cycle calculation is based on total energy used during the life time of the battery. Energy (kWhr) listed in the table shows total energy the battery would produce during its life time and therefore each application can easily determine the number of life cycles the battery is expected to perform. As an example a 260 ahr 12 volts battery pack (3.3 kWhr) has total of 11832 kWhr (2958 x 4 batteries in series) lifetime energy and therefore in an application where daily usage is 1.6 kWhr (50%) the cycle life of this pack would be  $11832/1.6 = 7,395$  cycles. Traditional rules of cycle life calculations used in lead acid batteries does not necessarily apply on Yttrium batteries that do not have a built in environmental degradation (sulfation) or charge/discharge memory known to be cause of end of life on lead acid batteries.

## 單體電池尺寸 DIMENSIONS



型号(MODEL): WB-LYP400AHA



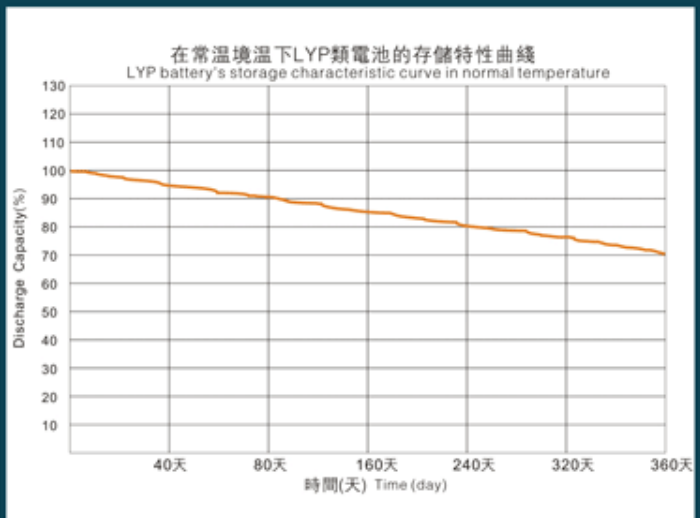
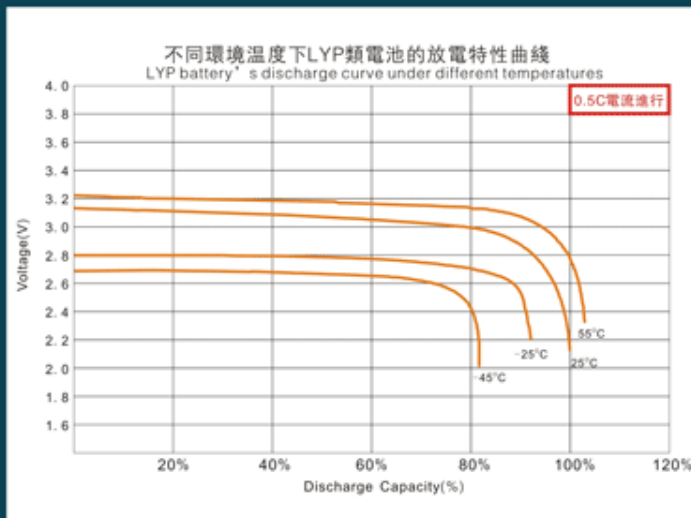
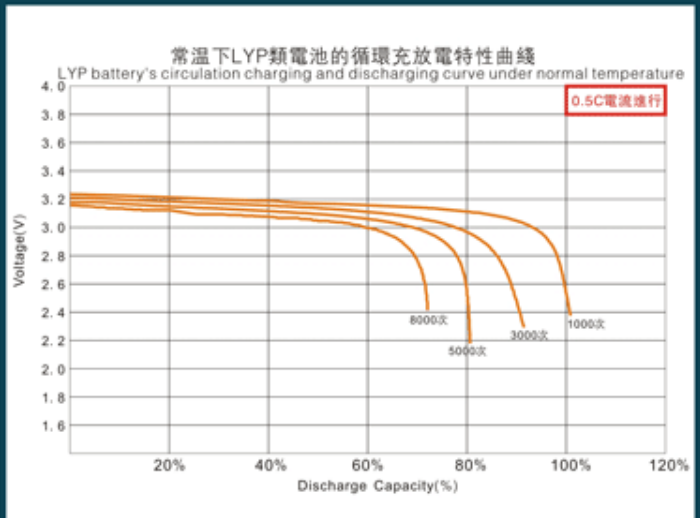
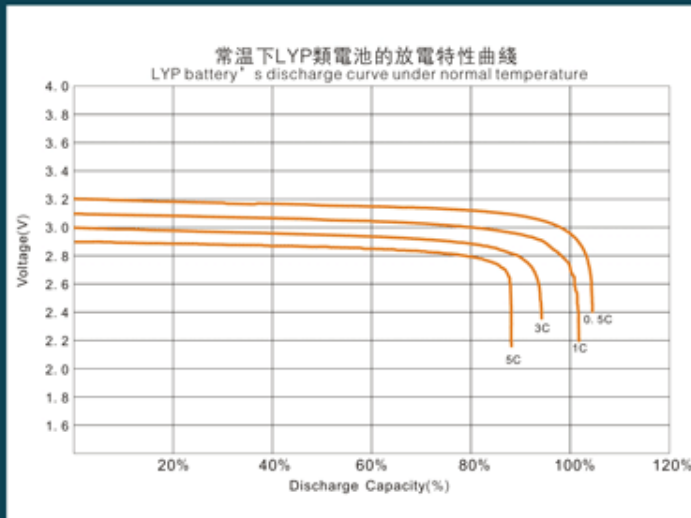
## 技術參數 SPECIFICATIONS

### 型號(MODEL): WB-LYP400AHA

標稱容量 Nominal Capacity	400Ah	
工作電壓 Operation Voltage	充電 (Charge)	4.0V
	放電 (Discharge)	2.8V
最大充電電流 Max Charge Current	≤3CA	
最大放電電流 Max Discharge Current	恒電流 (Constant Current)	≤ 3CA
	脈衝式 (Impulse Current)	≤ 20CA
標準充放電電流 Standard Charge/Discharge Current	0.5CA	
循環壽命 Cycle Life	(80DOD%)	≥5000Times
	(70DOD%)	≥7000Times
殼體耐溫性 Temperature Durability Of Case	≤200°C	
適應環境 Operating Temperature	充電 (Charge)	-45°C~85°C
	放電 (Discharge)	-45°C~85°C
自放電率(月) Self-discharge Rate	≤3% (Monthly)	
單體電池重量 Weight	13.5kg ± 200g	

# WB-LYP400AHA型電池的充放電特性

## WB-LYP400AHA CHARGE & DISCHARGE CHART



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