SB6-400D - 6V400Ah - EV/DC Series

The SB6-400D , a group L16 format, is a valve regulated AGM technology based battery specifically designed for high cycling applications. With a higher tin content, special thick plate structure, and a unique paste formulation the EV/DC Series provide a much longer cycle life compared to general purpose AGM batteries in cyclic applications such as mobility / electric vehicles, renewable energy, recreational vehicles and marine applications. An additional feature of the EV/DC Series, compared to general purpose AGM batteries, is the use of much thicker inter-cell connections within the battery. This additional feature is a must for high vibration applications such as mobility and material handling applications.

Specifications

- Nominal Voltage: 6 volts
- Nominal Capacity at 77°F/25°C
  20 Hour rate 400 Ah
  10 Hour rate 291 Ah
  5 Hour rate 351.3 Ah
  1 Hour rate 209.8 Ah
- Number of cells - 3
- Internal resistance - ±1.1 mΩ
- Operating Temperature Range - (See Charging recommendations)
  Discharge: -40°C to 60°C
  Charge: -20°C to 50°C
  Storage: -20°C to 60°C
- Max. Discharge current - 4000 A (5sec)
- Float Charge - 6.8 to 6.9 Volts @ 25°C
- Cyclic charge - 7.3 to 7.4 Volts @ 25°C
- Terminal configuration - F22(M8)
- Self discharge rate at 25°C - 3% per month

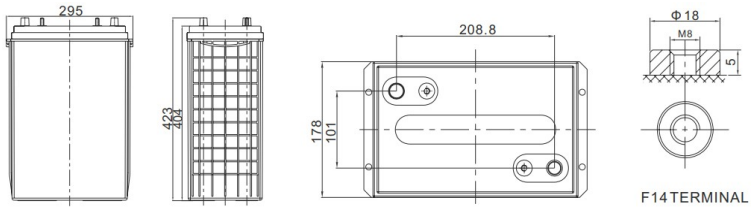
General Features

- AGM technology also called VRLA (Valve Regulated Lead Acid) has an efficient gas recombination process which allows for a maintenance free battery.
- Not restricted for air transport and complies with IATA/ICAO Special Privision A67.
- UL-recognized component (MH60449)
- Manufactured in a plant with the following standards:
  ISO 9001:2008
  ISO 14001:2004
  OHSAS 18001:2007
- Can be mounted in any orientation, but not to be charged in a inverted position.
- Computer designed lead/calcium/tin alloy grids for high power density. The lead is virgin lead of the highest purity.
- Designed for cyclic applications and can be used in float/standby applications.
- Low self discharge rate.

MH60449

Dimensions: 295(L)x178(W)x404(H) mm/11.6 x7.01x16.7 inches

Weight: Approx. 57 kg



Constant Current Discharge Characteristics: Amps @ 25°C

F.V/Time	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	376.8	227.6	139.0	109.2	86.8	74.2	49.2	40.8	20.8
1.65V	368.9	223.3	136.7	107.5	85.6	73.3	48.6	40.4	20.6
1.70V	358.4	217.6	133.5	105.3	84.0	72.0	47.9	39.8	20.3
1.75V	344.2	209.8	129.3	102.2	81.8	70.3	46.9	39.1	20.0
1.80V	324.7	199.1	123.3	98.0	78.8	68.0	45.5	38.0	19.5
1.85V	297.1	183.9	114.8	91.9	74.4	64.6	43.4	36.5	18.8

Constant Power Discharge Characteristics: Watts @ 25°C

F.V/Time	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	684	426	264	209	167	143	96.0	80.2	40.9
1.65V	680	422	261	207	165	142	95.2	79.5	40.6
1.70V	664	413	256	203	162	140	93.9	78.5	40.2
1.75V	645	400	249	198	159	137	92.1	77.1	39.5
1.80V	614	381	238	190	154	133	89.5	75.1	38.6
1.85V	568	355	223	179	145	127	85.7	72.2	37.3

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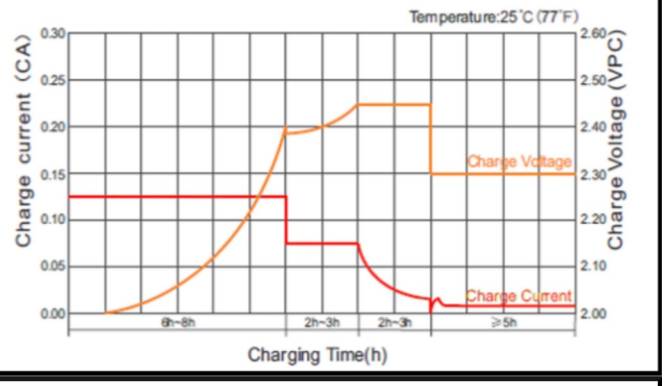
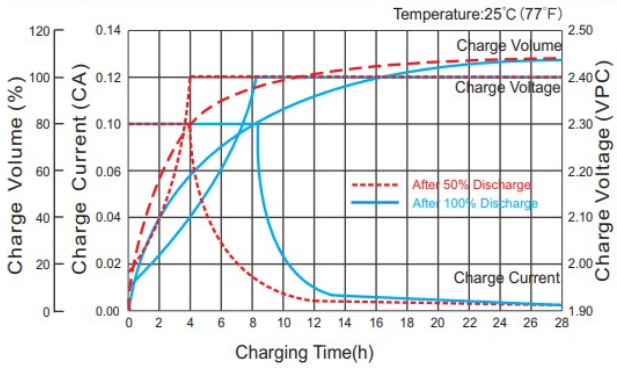
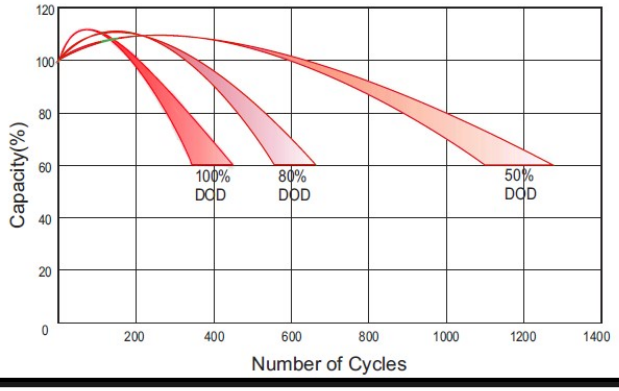
Charge Characteristic Curve for Cycle Use(IIUU)



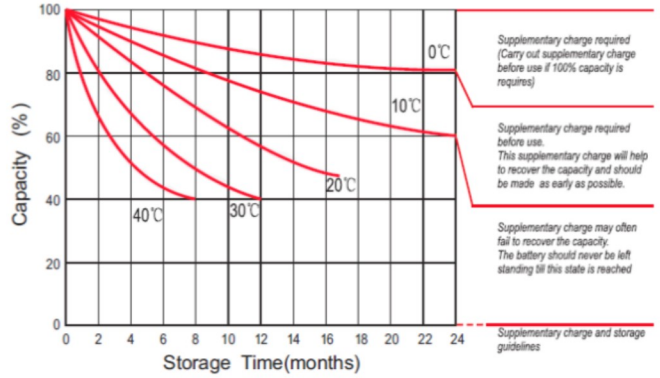
Charge Characteristics Curve for Cycle Use(IU)



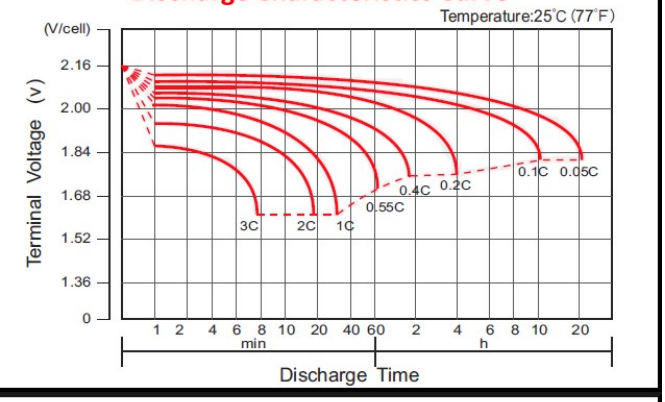
Cycle Life in Relation to Depth of Discharge



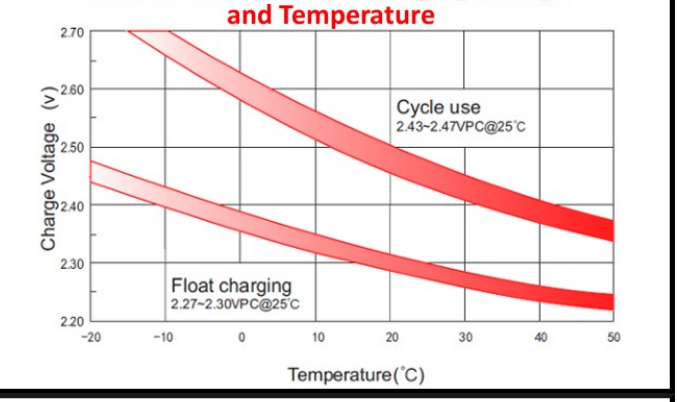
Storage Characteristics



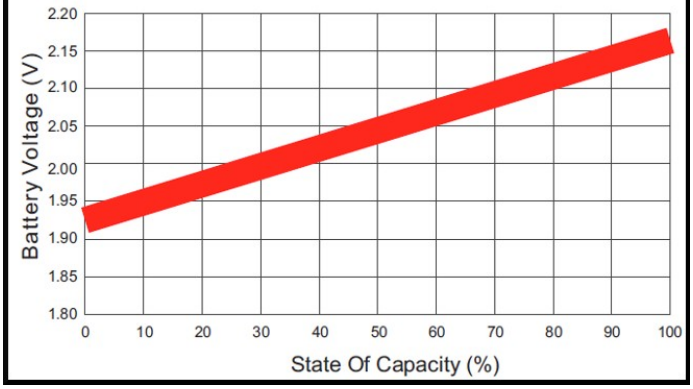
Discharge Characteristics Curve



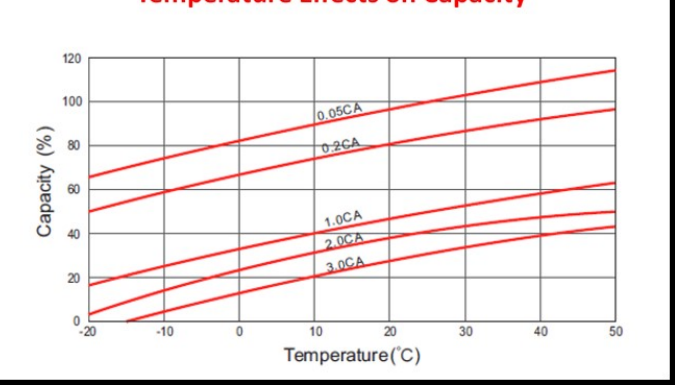
Relationship Between Charging Voltage and Temperature



Relationship of OCV And State of Charge(20℃)



Temperature Effects on Capacity



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Charging Recommendations

- For standby (float) use 2.27 to 2.3 volts per cell (@ 25°C).
- For cyclic use 2.43 to 2.47 volts per cell (@25°C)
- Recommended maximum charging current limit is 120 Amp.
- Charging voltage should be regulated in relation to the ambient temperature. When the temperature is higher, the charging voltage should be lower. Where the temperature is lower, the charging voltage be higher. (3 mVolts per °C per cell in standby applications and 4 mVolts per °C per cell in cyclic applications). Typical applications in a range of 0°C-30°C do not require this compensation.
- It is recommended that "refresh charging" be applied to any battery which has been stored for a long period of time, prior to putting the batteryinto service and/or within 6 months after manufacture.
- To obtain the optimum standby performance it is vital that the correct charging profile is utilised (see Charge Characteristics figures)
- Typically it takes more energy to recharge a battery that it has expended. The ratio is 1.1 - 1.15 has to get into battery for every 1.0 that was supplied by the battery.

Service Life

- Please refer to the life curves provided. These curves represent typical results under optimum operating conditions. Actual life will vary due to variability of these conditions.
- Improper charging (overcharging and lack of charging) is the *number one* reason why AGM/VRLA batteries fail prematurely. Follow charging guidelines found on this specification sheet.
- Elements that affect Cycle Life: There are various factors that will have an effect on the service life of AGM/VRLA battteries in cyclic applications; ambient operation temperature, discharge rate, depth of discharge, the manner in which the battery is recharged, and the timeliness of the recharge, to obtain maximum service life it is recommended not to go beyond 80% DOD (Depth Of Discharge) and if all possible limit it to 50 % DOD. At 50 % you will obtain the ideal trade-off for life expectancy for AGM batteries. This recommendation goes for all brands of AGM batteries.
- Elements that affect standby life: All the same factors are responsible but the most important in this case is the ambient temperature followed closely by the charging parameters. For example - in an enclosed UPS cabinet with no ventilation temperatures, are most ofter than not well above 25°C, henceforth battery life is severely affected.

Warnings

- Never install AGM/VRLA batteries in an airtight container.
- Keep away from sparks, and any source of flames.
- Connect cables tightly to avoid sparks at terminales.
- The electrolytes contains sulfuric acid which can cause serious damage to eyes and skin. Should this occur, flush profusely with water and seek medical attention.
- Do not short circuit AGM/VRLA terminals with metal object, they are capable of generating hundreds of amperes, you can seriously burn yourself in short circuiting a battery.
- Mixing batteries of different capacities, age and/or manufacturer is not recommended.