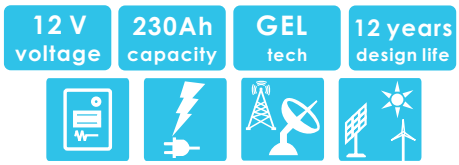
# SOLRA SERIES VRLA BATTERY

The Solar series is designed for frequent cyclic charge and discharge applications under extreme environments. By combining the newly developed Nano Gel electrolyte with high density paste, the Solar range offers high recharge efficiency at very low charge current. The acid stratification is highly reduced by adding Nano Gel.

This series is suited for energy storage for renewable energies such as PV, wing turbine power systems and CATV.




## TECHNICAL SPECIFICATIONS

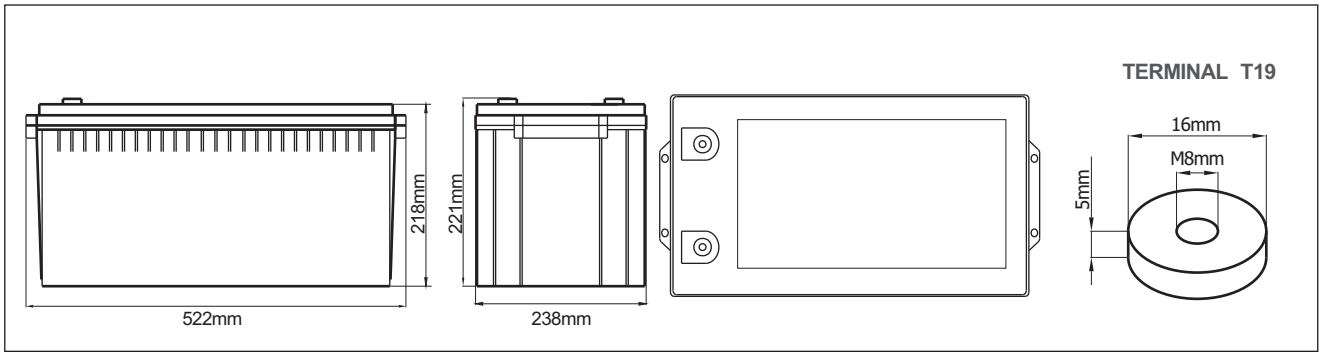
| | |
|---|---|
| **Nominal Voltage (V)** | 12 (6 cells per unit) |
| **Designed Floating Life (20°C)** | 12 Years |
| **Nominal Capacity (20°C)** | 230 Ah @ 10HR-rate (to 1.80Vpc) |
| **Dimension (mm)** | L522mm x W238mm x H221mm |
| **Approx. Weight** | 66.5 kg (146.6 lbs) |
| **Terminal Type** | Female Copper Insert M8 (torque:10~12N.m) |
| **Internal Resistance** | Approx. 0.003 Ohm (fully charged @ 20°C) |
| **Max. Charge Current** | 57.5A |
| **Max. Discharge Current (5S)** | 1500 A |
| **Short Circuit Current** | 4000 A |
| **Self Discharge** | Approx. 3% per month @ 20°C |
| **Ambient Temperature** | Discharge: -25~65°C<br>Charge: -25~60°C<br>Storage: -25~45°C |
| **Float Charge Voltage (20~25°C)** | 13.6-13.8V (-3mV/ cell/ °C) |
| **Equalize and cycle Use Charge Voltage (20~25°C)** | 14.4-14.8V (-5mV/ cell / °C) |
| **Container Material** | ABS (UL94-V0 optional) |

ISO9001 ISO14001

**Complied standards**

- IEC 60896-21/22
- IEC 61427
- UL1989
- JIS C8704
- GB/T19639

## BATTERY DIMENSIONS




## BATTERY DISCHARGE TABLE

| Constant Current Discharge Characteristics: Amps (25°C) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| F.V/Time | 30min | 1h | 2h | 3h | 4h | 5h | 8h | 10h | 20h |
| 1.70V | 234 | 146 | 87.5 | 63.6 | 50.8 | 42.4 | 28.8 | 23.8 | 12.5 |
| 1.75V | 225 | 143 | 86.0 | 62.6 | 50.2 | 41.8 | 28.4 | 23.5 | 12.3 |
| 1.80V | 215 | 139 | 84.2 | 61.4 | 49.0 | 40.8 | 27.7 | 23.0 | 12.1 |
| 1.85V | 203 | 133 | 80.9 | 59.4 | 47.6 | 39.8 | 27.1 | 22.4 | 11.8 |

| Constant Power Discharge Characteristics: W/cell (25°C) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| F.V/Time | 30min | 1h | 2h | 3h | 4h | 5h | 8h | 10h | 20h |
| 1.70V | 437 | 276 | 167 | 122 | 97.5 | 81.7 | 56.1 | 46.5 | 24.7 |
| 1.75V | 426 | 273 | 165 | 121 | 97.3 | 81.4 | 55.8 | 46.2 | 24.4 |
| 1.80V | 411 | 266 | 163 | 120 | 95.8 | 80.1 | 54.9 | 45.7 | 24.1 |
| 1.85V | 391 | 257 | 158 | 117 | 93.9 | 78.8 | 54.1 | 44.8 | 23.7 |

## PARAMETERS FOR SOLAR & WIND APPLICATIONS

**Long time discharge capacity for Solar & Wind applications**

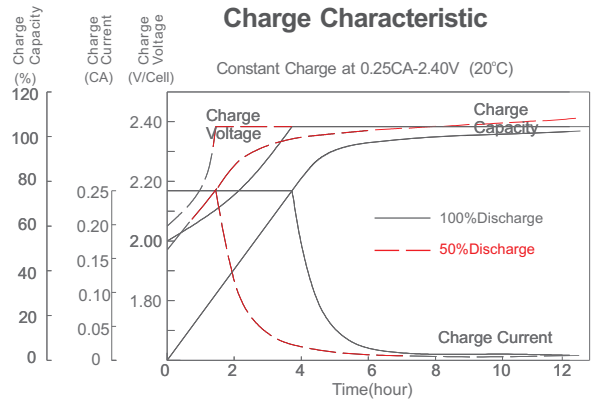
| Capacity | $C_{24}$ (Ah) | $C_{48}$ (Ah) | $C_{72}$ (Ah) | $C_{100}$ (Ah) | $C_{120}$ (Ah) |
|---|---|---|---|---|---|
| Solar12-230 | 246 | 260 | 267 | 278 | 288 |
| Final Voltage | 1.85V | | | | |

**Solar & Wind applications parameters settings**

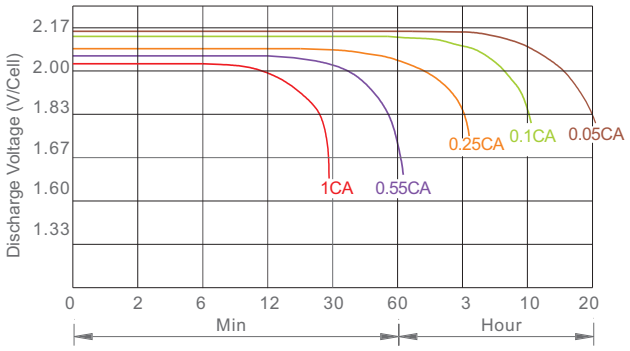
| | |
|---|---|
| Over voltage disconnect: | 2.45±0.01V/cell @ 20~25°C |
| Regulation/equalize voltage: | 2.40±0.01V/cell @ 20~25°C |
| Array roconnection voltage: | 2.25±0.005V/cell @ 20~25°C |
| Float voltage setting: | 2.27±0.005V/cell @ 20~25°C |
| Low voltage alarm voltage: | 1.95±0.005V/cell @ 20~25°C |
| Low voltage disconnect: | 1.90±0.005V/cell @ 20~25°C |
| Load reconnect voltage: | 2.09±0.01V/cell @ 20~25°C |
| Temp. compensate coefficienty: | -5mV/cell/°C |

## CHARACTERISTICS

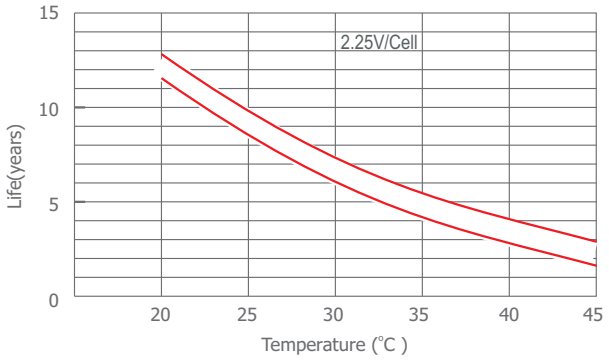
### Charge Characteristic



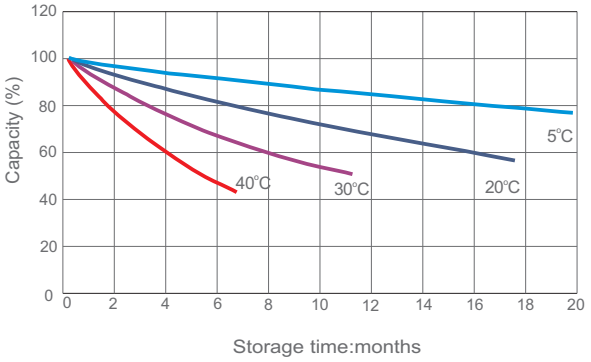

### Discharge Characteristic (20°C)



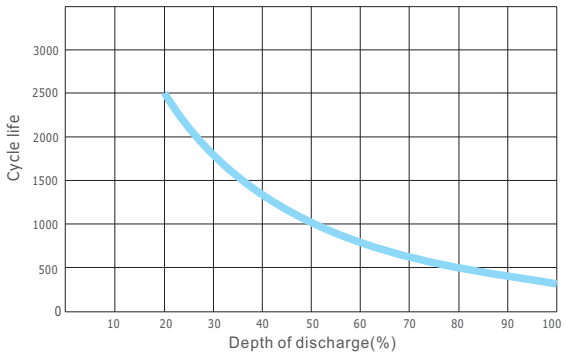

### Temperature vs Float Life



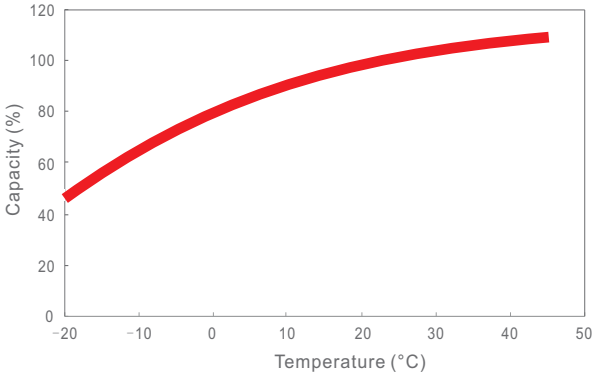

### Self discharge characteristics




### Depth of Discharge vs Cycle Life (20°C)




### Capacity vs Temperature




## FINAL VOLTAGE SETTINGS RECOMMENDED ACCORDING TO THE DISCHARGE CURRENT

| Discharge Current Ⅰ (A) | I ≤0.08C | 0.08C≤I<0.2C | 0.2C≤I<0.6C | 0.6C≤I<1.0C | I≥1.0C |
|---|---|---|---|---|---|
| Final of Voltage | ≥1.85Vpc | ≥1.80Vpc | ≥1.75Vpc | ≥1.70Vpc | ≥1.60Vpc |

## HEADQUARTERS AND SUBSIDIARIES

BSB Power Company Limited (HQ)
BSB Power Europe (France)
BSB Power Malaysia Sdn. Bhd
PT. BSB Indonesia
BSB Power (Thailand) Co., Ltd
BSB Power Company Pakistan Ltd