



## SPB OVERVIEW

### Valve Regulated AGM batteries

The SPB range of SUNLIGHT Valve Regulated Lead Acid batteries has been developed as advanced series, to provide reliable performance in the Uninterruptible Power Supply, Telecom, Information Technology and Emergency Power Supply Systems.

The Valve Regulated Lead Acid (VRLA) battery is a rechargeable battery type with a safety valve, which allows the internal pressure to be released in case of overcharge. This battery type is maintenance free as there is no need for topping-up water or electrolyte during the entire service life.

The SUNLIGHT SPB range of VRLA batteries features models with capacity from 33 up to 200Ah. SUNLIGHT SPB batteries have been developed to offer competitive solutions to the demanding market requirements, with specifications focused on high quality and reliability.

#### APPLICATIONS

UPS systems

Emergency power supply in power generation plants and substations

Telecommunications and electrical equipment

Switchboards

Robots, control equipment and other factory automation equipment

Security and fire alarm systems

Broadcasting systems

Various telemeter equipment

Signalization



#### CERTIFIED QUALITY

- The SUNLIGHT SPB 12V batteries are recognized by UL (File No MH18852).
- The SUNLIGHT Manufacturing Plant is certified according to ISO 9001:2000 and ISO 14001:2004.
- The SUNLIGHT SPB batteries comply with IEC 60896 Part 21 & 22 and BS6290 Part 4.
- As a member of EUROBAT organization SYSTEMS SUNLIGHT S.A. closely monitors the latest developments in the battery industry.
- Products are 100% tested and checked prior to shipment.
- The SUNLIGHT SPB batteries are completely recyclable.

#### QUALITY FEATURES & PRODUCT BENEFITS

##### High Performance

With low internal resistance and efficient discharge characteristics, SUNLIGHT SPB batteries can be applied to many fields, both in cycle and stand by use.

##### Maintenance Free

During the service life, there is no need to check the level of the electrolyte or to add water. The gases produced during electrolysis are almost completely recombined to water (up to 99%) through an effective reaction between hydrogen and oxygen.

##### Safety Valve Design

Excessive gas produced by overcharge or an incorrect charging method is released through the safety valve, which detects rising internal pressure and allows gas to exit; then automatically reseals.

##### Separator Technology

The Absorbent Glass Mat (AGM) separator, used in the SUNLIGHT batteries, is a highly porous material, which achieves maximization of oxygen diffusion and facilitates the reaction of active materials in the plates. The separator also maintains a constant distance between the positive and the negative plates and immobilizes the electrolyte, so that the possibility of acid leakage is minimized.

##### Performance on Wide Temperature Range

SUNLIGHT SPB batteries operate within a wide range of temperature while the optimum temperature for the operation of the battery is 20°C - 25°C.

##### Low Self-discharge Rate

Using a lead / calcium grid alloy, the self-discharge is minimum. The battery can be stored for 9 months under normal conditions (20°C - 25°C) with no permanent effect on the capacity or the expected service life.

##### Leak and Spill Proof Container

The construction of the SUNLIGHT SPB battery guarantees that no electrolyte leakage can occur from the terminals or case. A highly resistant plastic material is used, available in either standard ABS (UL94 HB) or flame retardant type (UL94 V-0).

##### Float Service Life

The nominal service life is 12 years in float / standby applications (20°C).

##### Multi-position Usage

The sealed construction of the battery allows perfect operation in any position (vertical or horizontal but not completely inverted position).

The ideal energy solution for stationary applications

#### FEATURES OF SPB RANGE

- Capacity Range: 33Ah to 200Ah
- Design Life: 12 years at 20°C
- Classified as: Long Life, according to EUROBAT guide 1999
- Configurations: 12V blocks available

**PRODUCT RANGE**

| Battery Type | Nominal Voltage (V) | Nominal Capacity (Ah) at 1.80 Vpc (25°) |     | Length (mm) | Width (mm) | Height (mm) | Overall Height (mm) | Typical Weight (kg) | Terminal Position | Terminal Type | Internal Resistance (mΩ) |
|--------------|---------------------|---|-----|-------------|------------|-------------|---------------------|---------------------|-------------------|---------------|--------------------------|
|              |                     | 20h                                     | 10h |             |            |             |                     |                     |                   |               |                          |
| SPB 12 - 33  | 12                  | 34                                      | 33  | 195         | 130        | 155         | 168                 | 11.00               | A                 | M6/Φ14        | 10.0                     |
| SPB 12 - 40  | 12                  | 44                                      | 40  | 197         | 165        | 170         | 170                 | 13.80               | B                 | M6/Φ14        | 9.5                      |
| SPB 12 - 55  | 12                  | 62                                      | 55  | 229         | 138        | 208         | 213                 | 18.00               | A                 | M6/Φ14        | 7.2                      |
| SPB 12 - 65  | 12                  | 68                                      | 65  | 350         | 167        | 179         | 179                 | 22.40               | A                 | M6/Φ14        | 6.8                      |
| SPB 12 - 75  | 12                  | 77                                      | 75  | 258         | 166        | 206         | 215                 | 22.50               | A                 | M6/Φ14        | 6.6                      |
| SPB 12 - 80  | 12                  | 82                                      | 80  | 350         | 167        | 179         | 179                 | 23.10               | A                 | M6/Φ14        | 6.5                      |
| SPB 12 - 100 | 12                  | 106                                     | 100 | 330         | 171        | 215         | 222                 | 32.00               | A                 | M6/Φ14        | 5.7                      |
| SPB 12 - 120 | 12                  | 124                                     | 120 | 410         | 176        | 224         | 224                 | 36.20               | A                 | M8/Φ16        | 5.3                      |
| SPB 12 - 150 | 12                  | 164                                     | 150 | 482         | 170        | 240         | 240                 | 47.00               | A                 | M8/Φ16        | 4.5                      |
| SPB 12 - 200 | 12                  | 210                                     | 200 | 522         | 238        | 218         | 223                 | 65.00               | D                 | M8/Φ16        | 3.5                      |

**DRAWINGS**

**Terminal Torque Settings**

|                    |         |
|--------------------|---------|
| <b>M6 Terminal</b> | 6-8 Nm  |
| <b>M8 Terminal</b> | 9-12 Nm |

**Case Dimensions**

**Terminals**

**Terminal Positions**

**DIAGRAMS**

Available Capacity vs. Temperature

Cycle Life vs. Depth of Discharge (DoD)

Typical Charging Time vs. Depth of Discharge (Initial charging current=0.2 C<sub>10</sub>)

Charging Voltage - Stand by Use

Charging Voltage - Cycle Use

Self-discharge Characteristics

| Temperature | Shelf Life |
|-------------|------------|
| 0 - 20°C    | 12 months  |
| 21 - 30°C   | 7 months   |
| 31 - 40°C   | 4 months   |
| 41 - 50°C   | 2,5 months |

### Performance Data

Discharge Constant Current at 25°C (Amperes)

| End Voltage 1.90 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 52.6   | 41.7   | 27.5   | 20.9   | 17.3  | 11.5 | 9.0  | 5.9  | 3.2  | 1.7  |
| SPB 12-40               | 64.9   | 51.4   | 33.4   | 25.3   | 20.8  | 13.3 | 10.2 | 6.9  | 3.9  | 2.1  |
| SPB 12-55               | 94.1   | 76.5   | 51.0   | 38.3   | 31.3  | 18.9 | 14.1 | 9.3  | 5.3  | 3.0  |
| SPB 12-65               | 106.8  | 86.7   | 55.9   | 41.7   | 34.1  | 20.3 | 15.0 | 10.3 | 6.3  | 3.3  |
| SPB 12-75               | 127.0  | 108.0  | 71.8   | 53.7   | 43.5  | 25.6 | 18.8 | 12.9 | 7.3  | 3.8  |
| SPB 12-80               | 136.3  | 112.6  | 73.8   | 55.5   | 45.1  | 26.7 | 19.7 | 13.2 | 7.8  | 4.0  |
| SPB 12-100              | 145.9  | 121.5  | 82.7   | 63.0   | 52.2  | 32.1 | 24.2 | 16.4 | 9.7  | 5.1  |
| SPB 12-120              | 184.2  | 153.4  | 100.9  | 76.3   | 61.0  | 36.3 | 26.8 | 18.7 | 11.6 | 6.1  |
| SPB 12-150              | 224.2  | 191.3  | 128.4  | 96.9   | 79.0  | 48.5 | 36.5 | 24.6 | 14.5 | 8.0  |
| SPB 12-200              | 273.0  | 233.0  | 163.7  | 129.1  | 106.2 | 65.4 | 49.2 | 33.4 | 19.3 | 10.2 |

| End Voltage 1.85 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 56.2   | 44.1   | 28.8   | 21.7   | 17.9  | 11.8 | 9.2  | 6.1  | 3.2  | 1.7  |
| SPB 12-40               | 69.3   | 54.5   | 35.0   | 26.3   | 21.5  | 13.7 | 10.5 | 7.1  | 3.9  | 2.1  |
| SPB 12-55               | 100.5  | 81.1   | 53.4   | 39.8   | 32.4  | 19.4 | 14.4 | 9.5  | 5.4  | 3.0  |
| SPB 12-65               | 114.0  | 91.9   | 58.5   | 43.4   | 35.4  | 20.9 | 15.3 | 10.5 | 6.4  | 3.4  |
| SPB 12-75               | 134.0  | 112.0  | 73.9   | 55.3   | 44.4  | 26.1 | 19.1 | 13.1 | 7.4  | 3.8  |
| SPB 12-80               | 143.5  | 117.4  | 76.0   | 56.9   | 46.1  | 27.2 | 20.0 | 13.4 | 7.9  | 4.1  |
| SPB 12-100              | 158.8  | 132.5  | 91.8   | 65.5   | 54.0  | 33.0 | 24.7 | 16.7 | 9.8  | 5.2  |
| SPB 12-120              | 196.5  | 161.9  | 105.0  | 79.0   | 62.9  | 37.2 | 27.4 | 19.1 | 11.8 | 6.1  |
| SPB 12-150              | 241.7  | 207.1  | 141.9  | 100.8  | 81.6  | 49.9 | 37.4 | 25.1 | 14.7 | 8.1  |
| SPB 12-200              | 291.0  | 246.0  | 170.4  | 133.8  | 109.6 | 67.1 | 50.3 | 34.1 | 19.7 | 10.4 |

| End Voltage 1.80 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 59.8   | 46.6   | 30.0   | 22.5   | 18.5  | 12.1 | 9.4  | 6.2  | 3.3  | 1.7  |
| SPB 12-40               | 73.7   | 57.5   | 36.5   | 27.3   | 22.3  | 14.0 | 10.7 | 7.2  | 4.0  | 2.2  |
| SPB 12-55               | 106.9  | 85.6   | 55.8   | 41.4   | 33.6  | 19.9 | 14.7 | 9.7  | 5.5  | 3.1  |
| SPB 12-65               | 121.3  | 97.0   | 61.1   | 45.1   | 36.6  | 21.5 | 15.7 | 10.7 | 6.5  | 3.4  |
| SPB 12-75               | 141.0  | 117.0  | 76.1   | 56.4   | 45.4  | 26.6 | 19.4 | 13.3 | 7.5  | 3.8  |
| SPB 12-80               | 150.7  | 122.2  | 78.2   | 58.2   | 47.0  | 27.7 | 20.3 | 13.6 | 8.0  | 4.1  |
| SPB 12-100              | 171.0  | 141.1  | 96.1   | 68.0   | 55.8  | 33.9 | 25.3 | 17.1 | 10.0 | 5.3  |
| SPB 12-120              | 209.0  | 170.4  | 109.2  | 81.8   | 64.9  | 38.3 | 28.1 | 19.5 | 12.0 | 6.2  |
| SPB 12-150              | 258.3  | 219.2  | 148.0  | 104.0  | 84.1  | 51.2 | 38.3 | 25.7 | 15.0 | 8.2  |
| SPB 12-200              | 310.0  | 259.0  | 177.2  | 138.1  | 113.0 | 68.8 | 51.5 | 34.8 | 20.0 | 10.5 |

| End Voltage 1.75 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 63.4   | 49.1   | 31.3   | 23.4   | 19.1  | 12.4 | 9.6  | 6.3  | 3.4  | 1.7  |
| SPB 12-40               | 78.1   | 60.5   | 38.0   | 28.3   | 23.0  | 14.4 | 11.0 | 7.3  | 4.1  | 2.2  |
| SPB 12-55               | 113.3  | 90.1   | 58.1   | 43.0   | 34.7  | 20.5 | 15.1 | 9.9  | 5.6  | 3.1  |
| SPB 12-65               | 128.6  | 102.1  | 63.7   | 46.7   | 37.8  | 22.1 | 16.1 | 10.9 | 6.6  | 3.5  |
| SPB 12-75               | 148.0  | 121.0  | 78.2   | 58.0   | 46.4  | 27.0 | 19.7 | 13.5 | 7.6  | 3.9  |
| SPB 12-80               | 157.9  | 127.0  | 80.5   | 59.7   | 48.0  | 28.1 | 20.6 | 13.8 | 8.1  | 4.2  |
| SPB 12-100              | 183.2  | 148.5  | 99.1   | 70.4   | 57.6  | 34.8 | 25.9 | 17.4 | 10.2 | 5.3  |
| SPB 12-120              | 221.0  | 178.9  | 113.4  | 84.3   | 66.9  | 39.2 | 28.7 | 19.9 | 12.2 | 6.3  |
| SPB 12-150              | 275.0  | 228.8  | 152.2  | 107.3  | 86.6  | 52.4 | 39.1 | 26.2 | 15.3 | 8.3  |
| SPB 12-200              | 328.0  | 272.0  | 184.0  | 142.8  | 116.4 | 70.6 | 52.7 | 35.5 | 20.3 | 10.6 |

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### Performance Data

Discharge Constant Current at 25°C (Amperes)

| End Voltage 1.70 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 67.0   | 51.5   | 32.6   | 24.3   | 19.8  | 12.8 | 9.9  | 6.4  | 3.4  | 1.8  |
| SPB 12-40               | 82.5   | 63.6   | 39.6   | 29.4   | 23.8  | 14.8 | 11.2 | 7.5  | 4.1  | 2.2  |
| SPB 12-55               | 119.7  | 94.6   | 60.5   | 44.5   | 35.8  | 21.0 | 15.4 | 10.1 | 5.7  | 3.2  |
| SPB 12-65               | 135.8  | 107.2  | 66.3   | 48.4   | 39.1  | 22.6 | 16.4 | 11.1 | 6.7  | 3.5  |
| SPB 12-75               | 154.0  | 126.0  | 80.3   | 59.5   | 47.3  | 27.5 | 20.0 | 13.7 | 7.7  | 3.9  |
| SPB 12-80               | 165.1  | 131.9  | 82.7   | 61.0   | 49.0  | 28.6 | 20.9 | 14.0 | 8.2  | 4.2  |
| SPB 12-100              | 194.8  | 156.3  | 100.2  | 72.9   | 59.4  | 35.7 | 26.5 | 17.8 | 10.3 | 5.4  |
| SPB 12-120              | 233.0  | 187.4  | 117.5  | 87.0   | 68.8  | 40.2 | 29.3 | 20.3 | 12.4 | 6.4  |
| SPB 12-150              | 290.5  | 240.1  | 153.3  | 110.7  | 89.2  | 53.8 | 40.0 | 26.7 | 15.5 | 8.4  |
| SPB 12-200              | 347.0  | 285.0  | 190.7  | 147.5  | 119.8 | 72.3 | 53.8 | 36.2 | 20.7 | 10.8 |

| End Voltage 1.65 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 70.5   | 54.0   | 33.9   | 25.1   | 20.4  | 13.1 | 10.1 | 6.5  | 3.5  | 1.8  |
| SPB 12-40               | 86.9   | 66.6   | 41.1   | 30.3   | 24.5  | 15.2 | 11.5 | 7.6  | 4.2  | 2.3  |
| SPB 12-55               | 126.1  | 99.2   | 62.9   | 46.0   | 36.9  | 21.6 | 15.8 | 10.3 | 5.8  | 3.2  |
| SPB 12-65               | 143.1  | 112.4  | 68.9   | 50.2   | 40.3  | 23.2 | 16.8 | 11.3 | 6.8  | 3.6  |
| SPB 12-75               | 161.0  | 131.0  | 82.5   | 60.6   | 48.3  | 28.0 | 20.3 | 13.9 | 7.8  | 4.0  |
| SPB 12-80               | 172.4  | 136.7  | 84.9   | 62.4   | 50.0  | 29.1 | 21.2 | 14.2 | 8.3  | 4.3  |
| SPB 12-100              | 209.8  | 163.0  | 101.7  | 75.3   | 61.2  | 36.6 | 27.1 | 18.1 | 10.5 | 5.5  |
| SPB 12-120              | 246.0  | 196.0  | 121.7  | 89.8   | 70.8  | 41.2 | 30.0 | 20.6 | 12.6 | 6.5  |
| SPB 12-150              | 311.5  | 248.7  | 155.1  | 114.0  | 91.7  | 55.0 | 40.8 | 27.2 | 15.8 | 8.5  |
| SPB 12-200              | 365.0  | 298.0  | 197.5  | 152.2  | 123.2 | 74.1 | 55.0 | 36.9 | 21.0 | 10.9 |

| End Voltage 1.60 V/cell |        |        |        |        |       |      |      |      |      |      |
|-------------------------|--------|--------|--------|--------|-------|------|------|------|------|------|
|                         | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h  | 3 h  | 5 h  | 10 h | 20 h |
| SPB 12-33               | 74.1   | 56.5   | 35.1   | 25.9   | 21.0  | 13.4 | 10.3 | 6.7  | 3.5  | 1.8  |
| SPB 12-40               | 91.3   | 69.7   | 42.7   | 31.4   | 25.3  | 15.6 | 11.7 | 7.8  | 4.3  | 2.3  |
| SPB 12-55               | 132.5  | 103.7  | 65.2   | 47.5   | 38.1  | 22.1 | 16.1 | 10.5 | 5.9  | 3.2  |
| SPB 12-65               | 150.3  | 117.5  | 71.5   | 51.8   | 41.5  | 23.8 | 17.2 | 11.6 | 6.9  | 3.6  |
| SPB 12-75               | 168.0  | 135.0  | 84.6   | 62.1   | 49.2  | 28.4 | 20.6 | 14   | 7.9  | 4.0  |
| SPB 12-80               | 179.6  | 141.5  | 87.1   | 63.8   | 51.0  | 29.6 | 21.5 | 14.4 | 8.4  | 4.3  |
| SPB 12-100              | 221.3  | 169.7  | 104.0  | 77.7   | 63.0  | 37.5 | 27.7 | 18.5 | 10.7 | 5.6  |
| SPB 12-120              | 258.0  | 204.0  | 125.9  | 92.5   | 72.7  | 42.1 | 30.6 | 21.0 | 12.8 | 6.6  |
| SPB 12-150              | 326.2  | 258.2  | 159.7  | 117.9  | 94.3  | 56.4 | 41.7 | 27.7 | 16.0 | 8.6  |
| SPB 12-200              | 384.0  | 311.0  | 204.0  | 156.6  | 126.6 | 75.8 | 56.1 | 37.6 | 21.4 | 11.1 |

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### Performance Data

#### Discharge Constant Power at 25°C (Watts/cell)

| End Voltage 1.90 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 138.6 | 103.8  | 81.4   | 54.7   | 41.7   | 34.6  | 23.1  | 18.2  | 12.3 | 6.7  |
| SPB 12-40               | 168.1 | 125.8  | 100.0  | 65.9   | 50.7   | 42.2  | 27.6  | 21.1  | 14.4 | 8.1  |
| SPB 12-55               | 233.0 | 183.7  | 147.2  | 100.2  | 76.5   | 63.3  | 40.8  | 29.9  | 18.6 | 10.6 |
| SPB 12-65               | 264.0 | 201.0  | 164.6  | 111.0  | 83.4   | 68.5  | 42.6  | 31.1  | 20.9 | 12.8 |
| SPB 12-75               | 285.0 | 235.0  | 194.0  | 132.0  | 101    | 83.0  | 50.6  | 36.9  | 24.8 | 14.1 |
| SPB 12-80               | 322.0 | 267.0  | 222.0  | 151.1  | 115.2  | 94.4  | 57.4  | 41.6  | 27.5 | 16.3 |
| SPB 12-100              | 352.5 | 283.8  | 235.9  | 166.5  | 129.2  | 108.3 | 68.7  | 50.2  | 33.1 | 19.6 |
| SPB 12-120              | 407.0 | 351.0  | 297.0  | 210.0  | 161.0  | 129.9 | 77.4  | 57.1  | 39.5 | 24.5 |
| SPB 12-150              | 488.8 | 436.3  | 375.6  | 271.9  | 210.0  | 174.0 | 108.4 | 78.4  | 51.6 | 30.4 |
| SPB 12-200              | 591.0 | 530.0  | 453.0  | 346.0  | 274.0  | 226.0 | 139.9 | 102.1 | 69.7 | 40.3 |

| End Voltage 1.85 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 148.8 | 109.9  | 85.6   | 56.9   | 43.1   | 35.7  | 23.6  | 18.6  | 12.4 | 6.5  |
| SPB 12-40               | 180.4 | 133.2  | 105.1  | 68.6   | 52.5   | 43.5  | 28.2  | 21.5  | 14.6 | 8.0  |
| SPB 12-55               | 250.0 | 194.5  | 154.8  | 104.3  | 79.2   | 65.3  | 41.7  | 30.5  | 18.8 | 10.7 |
| SPB 12-65               | 284.0 | 213.0  | 173.0  | 115.5  | 86.3   | 70.7  | 43.5  | 31.6  | 21.2 | 12.9 |
| SPB 12-75               | 305.0 | 247.0  | 202.0  | 136.0  | 104.0  | 84.8  | 51.4  | 37.5  | 25.2 | 14.2 |
| SPB 12-80               | 341.0 | 277.0  | 229.0  | 154.0  | 116.8  | 95.4  | 57.8  | 41.8  | 27.7 | 16.3 |
| SPB 12-100              | 389.6 | 305.0  | 254.4  | 182.9  | 133.1  | 111.1 | 70.0  | 50.9  | 33.4 | 19.6 |
| SPB 12-120              | 442.0 | 370.0  | 309.0  | 216.0  | 165.0  | 132.8 | 78.8  | 57.9  | 39.8 | 24.6 |
| SPB 12-150              | 535.5 | 464.1  | 400.7  | 296.9  | 216.0  | 177.9 | 110.3 | 79.6  | 52.1 | 30.5 |
| SPB 12-200              | 641.0 | 559.0  | 472.0  | 356.0  | 281.0  | 231.0 | 142.4 | 103.6 | 70.3 | 40.6 |

| End Voltage 1.80 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 159.0 | 116.0  | 89.8   | 59.1   | 44.6   | 36.8  | 24.1  | 18.9  | 12.6 | 6.7  |
| SPB 12-40               | 192.7 | 140.6  | 110.2  | 71.3   | 54.3   | 44.8  | 28.9  | 21.9  | 14.7 | 8.2  |
| SPB 12-55               | 267.0 | 205.0  | 162.4  | 108.4  | 81.9   | 67.3  | 42.7  | 31.0  | 19.0 | 10.8 |
| SPB 12-65               | 303.0 | 225.0  | 181.5  | 120.0  | 89.2   | 72.8  | 44.5  | 32.2  | 21.4 | 13.0 |
| SPB 12-75               | 326.0 | 259.0  | 210.0  | 140.0  | 106.0  | 86.6  | 52.3  | 38.2  | 25.6 | 14.4 |
| SPB 12-80               | 360.0 | 288.0  | 236.0  | 156.8  | 118.4  | 96.5  | 58.1  | 42.0  | 27.8 | 16.4 |
| SPB 12-100              | 425.4 | 324.9  | 268.3  | 190.0  | 137.0  | 114.0 | 71.3  | 51.7  | 33.7 | 19.7 |
| SPB 12-120              | 476.0 | 389.0  | 322.0  | 222.0  | 169.0  | 135.7 | 80.1  | 58.8  | 40.2 | 24.7 |
| SPB 12-150              | 580.2 | 490.0  | 419.6  | 306.6  | 221.0  | 181.8 | 112.2 | 80.7  | 52.6 | 30.7 |
| SPB 12-200              | 691.0 | 587.0  | 491.0  | 366.0  | 287.0  | 236.0 | 144.8 | 105.1 | 71.0 | 40.8 |

| End Voltage 1.75 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 169.2 | 122.1  | 93.9   | 61.3   | 46.1   | 37.8  | 24.6  | 19.2  | 12.7 | 6.9  |
| SPB 12-40               | 205.0 | 148.0  | 115.4  | 74.0   | 56.1   | 46.1  | 29.5  | 22.2  | 14.9 | 8.4  |
| SPB 12-55               | 284.0 | 216.0  | 169.9  | 112.4  | 84.6   | 69.2  | 43.6  | 31.5  | 19.2 | 10.9 |
| SPB 12-65               | 322.0 | 237.0  | 189.9  | 124.5  | 92.1   | 74.9  | 45.5  | 32.7  | 21.6 | 13.1 |
| SPB 12-75               | 346.0 | 272.0  | 218.0  | 144.0  | 109.0  | 88.5  | 53.2  | 38.8  | 25.9 | 14.6 |
| SPB 12-80               | 379.0 | 299.0  | 243.0  | 159.6  | 120.0  | 97.5  | 58.5  | 42.2  | 27.9 | 16.4 |
| SPB 12-100              | 461.4 | 345.1  | 279.8  | 194.6  | 140.9  | 116.9 | 72.6  | 52.5  | 34.0 | 19.8 |
| SPB 12-120              | 510.0 | 408.0  | 334.0  | 229.0  | 172.9  | 138.6 | 81.4  | 59.6  | 40.6 | 24.9 |
| SPB 12-150              | 625.2 | 516.0  | 434.7  | 312.2  | 226.0  | 185.7 | 114.1 | 81.8  | 53.1 | 31.0 |
| SPB 12-200              | 741.0 | 615.0  | 510.0  | 376.0  | 294.0  | 241.0 | 147.2 | 106.5 | 71.7 | 41.0 |

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### Performance Data

#### Discharge Constant Power at 25°C (Watts/cell)

| End Voltage 1.70 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 179.4 | 128.2  | 98.1   | 63.5   | 47.5   | 38.9  | 25.1  | 19.5  | 12.9 | 6.9  |
| SPB 12-40               | 217.0 | 155.4  | 120.5  | 76.6   | 57.8   | 47.4  | 30.1  | 22.6  | 15.1 | 8.3  |
| SPB 12-55               | 301.0 | 227.0  | 177.5  | 116.5  | 87.3   | 71.2  | 44.5  | 32.1  | 19.4 | 10.9 |
| SPB 12-65               | 342.0 | 249.0  | 198.4  | 129.0  | 95.0   | 77.1  | 46.4  | 33.3  | 21.9 | 13.2 |
| SPB 12-75               | 368.0 | 284.0  | 227.0  | 148.0  | 112.0  | 90.4  | 54.1  | 39.4  | 26.4 | 14.8 |
| SPB 12-80               | 398.0 | 309.0  | 249.0  | 162.5  | 121.6  | 98.6  | 58.9  | 42.5  | 28.1 | 16.5 |
| SPB 12-100              | 495.4 | 363.6  | 292.1  | 195.1  | 144.8  | 119.7 | 73.9  | 53.2  | 34.3 | 19.8 |
| SPB 12-120              | 545.0 | 426.0  | 347.0  | 235.0  | 176.9  | 141.5 | 82.8  | 60.4  | 40.9 | 25.0 |
| SPB 12-150              | 667.4 | 539.7  | 450.1  | 311.5  | 231.0  | 189.6 | 116.0 | 83.0  | 53.6 | 31.1 |
| SPB 12-200              | 791.0 | 644.0  | 529.0  | 386.0  | 301.0  | 246.0 | 149.7 | 108.0 | 72.3 | 41.3 |

| End Voltage 1.65 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 189.5 | 134.3  | 102.3  | 65.8   | 49.0   | 40.0  | 25.7  | 19.9  | 13.0 | 7.0  |
| SPB 12-40               | 230.0 | 162.8  | 125.7  | 79.3   | 59.6   | 48.8  | 30.7  | 23.0  | 15.2 | 8.4  |
| SPB 12-55               | 318.0 | 238.0  | 185.1  | 120.6  | 90.0   | 73.2  | 45.4  | 32.6  | 19.7 | 11.1 |
| SPB 12-65               | 361.0 | 260.0  | 207.0  | 133.5  | 98.0   | 79.2  | 47.4  | 33.8  | 22.1 | 13.3 |
| SPB 12-75               | 389.0 | 297.0  | 235.0  | 152.0  | 114.0  | 92.3  | 55.0  | 40.0  | 26.8 | 15.0 |
| SPB 12-80               | 418.0 | 320.0  | 256.0  | 165.3  | 123.2  | 99.6  | 59.2  | 42.7  | 28.2 | 16.5 |
| SPB 12-100              | 539.2 | 389.2  | 302.3  | 196.8  | 148.7  | 122.6 | 75.2  | 54.0  | 34.6 | 20.1 |
| SPB 12-120              | 579.0 | 445.0  | 359.0  | 241.0  | 180.9  | 144.4 | 84.1  | 61.2  | 41.3 | 25.3 |
| SPB 12-150              | 721.7 | 573.8  | 463.3  | 312.6  | 236.0  | 193.4 | 117.9 | 84.1  | 54.1 | 31.4 |
| SPB 12-200              | 840.0 | 672.0  | 548.0  | 396.0  | 308.0  | 251.0 | 152.1 | 109.5 | 73.0 | 41.5 |

| End Voltage 1.60 V/cell |       |        |        |        |        |       |       |       |      |      |
|-------------------------|-------|--------|--------|--------|--------|-------|-------|-------|------|------|
|                         | 5 min | 10 min | 15 min | 30 min | 45 min | 1 h   | 2 h   | 3 h   | 5 h  | 10 h |
| SPB 12-33               | 199.7 | 140.4  | 106.5  | 68.0   | 50.4   | 41.1  | 26.2  | 20.2  | 13.1 | 6.8  |
| SPB 12-40               | 242.0 | 170.1  | 130.8  | 82.0   | 61.4   | 50.1  | 31.4  | 23.4  | 15.4 | 8.5  |
| SPB 12-55               | 335.0 | 248.0  | 192.6  | 124.6  | 92.6   | 75.2  | 46.4  | 33.1  | 19.9 | 11.2 |
| SPB 12-65               | 381.0 | 272.0  | 215.0  | 138.0  | 100.9  | 81.4  | 48.4  | 34.4  | 22.4 | 13.3 |
| SPB 12-75               | 412.0 | 310.0  | 245.0  | 156.0  | 117.0  | 94.2  | 55.9  | 40.6  | 27.1 | 15.3 |
| SPB 12-80               | 437.0 | 330.0  | 263.0  | 168.2  | 124.8  | 100.6 | 59.6  | 42.9  | 28.3 | 16.5 |
| SPB 12-100              | 573.8 | 408.0  | 312.5  | 199.9  | 152.6  | 125.5 | 76.6  | 54.7  | 35.0 | 20.2 |
| SPB 12-120              | 613.0 | 464.0  | 371.0  | 247.0  | 184.9  | 147.3 | 85.5  | 62.1  | 41.7 | 25.4 |
| SPB 12-150              | 764.7 | 597.9  | 475.4  | 317.0  | 242.0  | 197.3 | 119.7 | 85.2  | 54.6 | 31.5 |
| SPB 12-200              | 890.0 | 701.0  | 567.0  | 407.0  | 315.0  | 256.0 | 154.5 | 111.0 | 73.6 | 41.9 |

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