

# SPA AGM VRLA batteries for Stationary Applications



 **SUNLIGHT**  
Reliable Battery Solutions

## SPA OVERVIEW

### Valve Regulated AGM batteries

The SPA range of SUNLIGHT Valve Regulated Lead Acid batteries has been developed as general purpose batteries, designed to provide reliable performance in a wide field of applications. The SUNLIGHT SPA batteries respond to the needs of security and signalling systems market, low power UPS, telecommunications, information technology and emergency power supply.

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 SPA range of VRLA batteries features models with capacity up to 28Ah, offering a dense range of performances and dimensions also available with different types of terminals and flame retardant cases.

#### APPLICATIONS

- Security and fire alarm systems
- Low power UPS systems
- Emergency Lighting systems
- Signaling systems
- Communications and electric equipment
- Broadcasting systems
- Robots and factory automation control equipment
- Automation boards for elevators
- Electronic cash registers



#### CERTIFIED QUALITY

- The SUNLIGHT SPA batteries are recognized by UL (File No MH18852).
- The SUNLIGHT Manufacturing Plant is certified according to ISO 9001:2000 and ISO 14001:2004.
- Selected models of the SUNLIGHT SPA batteries are approved by VDS.
- 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 SPA batteries are completely recyclable.

#### QUALITY FEATURES & PRODUCT BENEFITS

##### High Performance

With low internal resistance and efficient discharge characteristics, the SUNLIGHT SPA 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

The SUNLIGHT SPA 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 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 up to 5 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

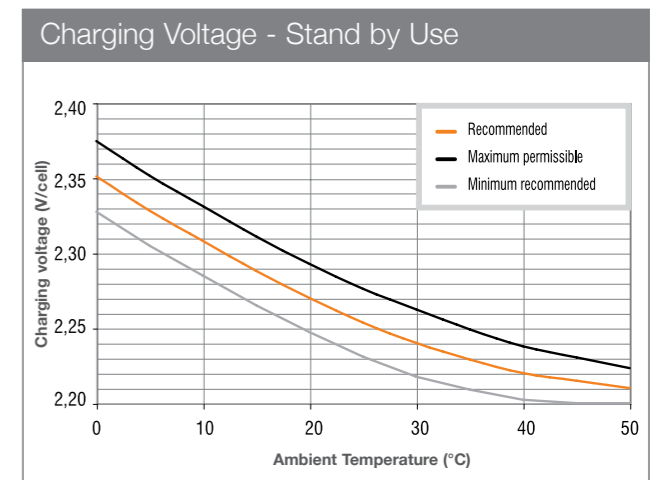
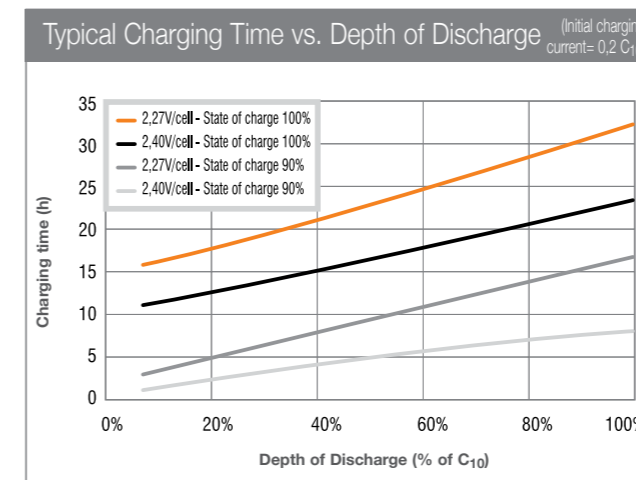
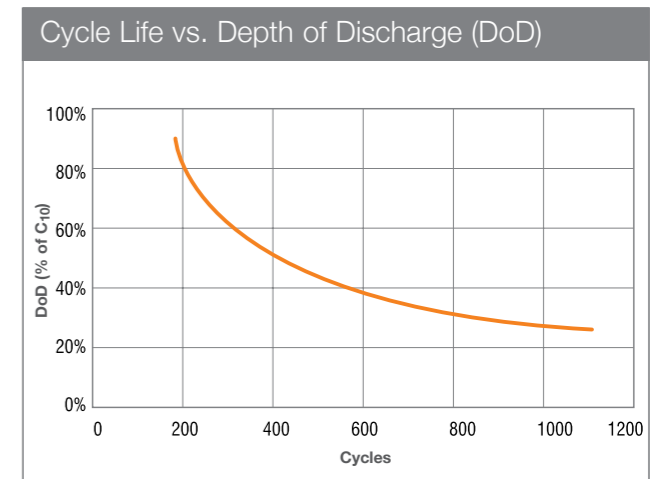
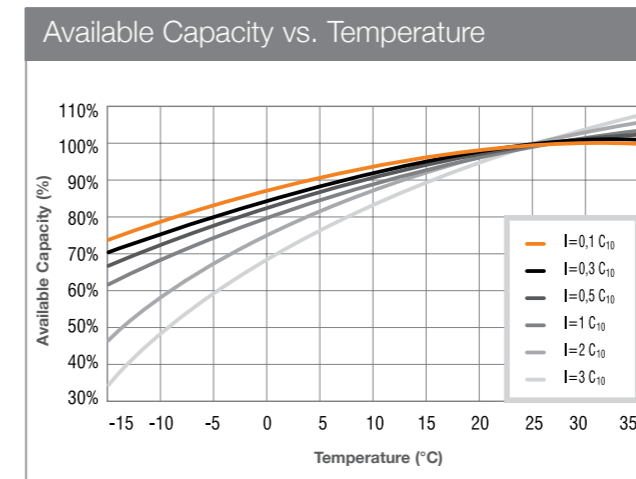
#### FEATURES OF SPA RANGE

- Capacity Range: 0,7Ah to 28Ah
- Design Life: up to 5 years at 20°C
- Classified as: Standard Commercial, according to EUROBAT guide 1999
- Configurations: 4V, 6V, 8V and 12V blocks available

**PRODUCT RANGE**

Battery Type	Nominal Voltage (V)	Nominal Capacity (Ah) at 1.80 Vpc (25°)		Length (mm)	Width (mm)	Height (h) (mm)	Height (H) (mm)	Typical Weight (kg)	Terminal Position	Terminal Type	Maximum Current (25°)		Internal Resistance (mΩ)
		20h	10h								Charging (A)	Discharging (A)	
SPA 4 - 9.5	4	9.3	8.7	102	44	95	101	1.10	A	F1	3.80	142.5	8
SPA 6 - 1.3	6	1.3	1.2	97	24	52	58	0.31	A	F1	0.48	18.0	50
SPA 6 - 2.5	6	2.7	2.5	66	33	97	104	0.58	C	F1	1.12	42.0	25
SPA 6 - 2.8	6	2.7	2.6	66	33	97	104	0.58	C	F1	1.12	42.0	25
SPA 6 - 3.2	6	3.1	3.0	134	34	61	67	0.66	A	F1	1.28	48.0	25
SPA 6 - 4.5	6	4.9	4.5	70	47	101	107	0.77	C	F1	2.0	75.0	27
SPA 6 - 7	6	6.9	6.3	151	34	94	100	1.20	A	F1	2.8	105	15
SPA 6 - 8	6	7.8	7.5	98	56	117	117	1.69	E	F1	3.2	120	11
SPA 6 - 10	6	9.8	9.1	151	50	94	100	1.67	A	F1	4.0	150	15
SPA 6 - 12	6	11.7	11.0	151	50	94	100	1.85	A	F1	4.8	180	10
SPA 8 - 3.2	8	3.1	3.0	134	36	63	69	0.76	D	F1	1.3	48.0	32
SPA 12 - 0.7	12	0.7	0.7	96	25	62	62	0.34	-	F5	0.3	12.0	250
SPA 12 - 1.3	12	1.3	1.2	97	43	52	58	0.53	D	F1	0.5	18.0	50
SPA 12 - 1.9	12	2.1	1.9	178	35	61	67	0.99	A	F1	0.9	34.5	60
SPA 12 - 2C	12	1.7	1.6	144	24	65	65	0.60	G	F4	0.6	24.0	50
SPA 12 - 2.3	12	2.3	2.1	178	35	61	67	0.99	A	F1	0.9	34.5	60
SPA 12 - 2.3C	12	2.1	1.9	182	24	61	61	0.67	G	F4	0.9	35.0	80
SPA 12 - 3.3	12	3.2	3.0	134	67	61	67	1.32	D	F1	1.3	48.0	68
SPA 12 - 5	12	4.9	4.6	90	70	101	107	1.80	A	F1	2.0	75.0	42
SPA 12 - 6	12	5.9	5.7	151	52	94	99	2.18	F	F1	2.4	90.0	25
SPA 12 - 7	12	6.9	6.4	151	65	94	100	2.37	F	F1	2.8	105	30
SPA 12 - 7.2	12	7.0	6.5	151	65	94	100	2.37	F	F1	2.8	105	30
SPA 12 - 9	12	8.8	8.2	151	65	94	100	2.80	F	F1	3.6	135	18
SPA 12 - 10	12	9.8	9.1	151	98	95	101	3.30	F	F1	4.0	150	30
SPA 12 - 10S	12	9.8	9.1	151	65	111	117	3.32	F	F1	4.0	150	18
SPA 12 - 12	12	11.7	11.3	151	98	95	101	3.74	F	F1	4.8	180	19
SPA 12 - 18	12	17.6	16.5	181	77	167	167	5.50	B	F2	6.8	255	14
SPA 12 - 26	12	25.5	23.2	166	175	125	125	8.15	B	F2	9.6	300	10
SPA 12 - 28	12	27.4	25.6	165	125	175	182	9.30	B	F3	11.2	310	8

**DIAGRAMS**



**DRAWINGS**

**Case Dimensions**

**Terminal Positions**

**F1**

F1: Faston Tab 4,8

**F2**

F2: Bold Fastened Terminal

**F3**

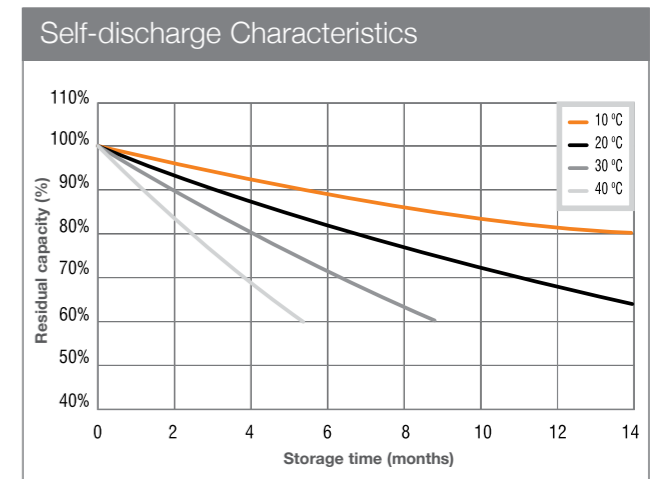
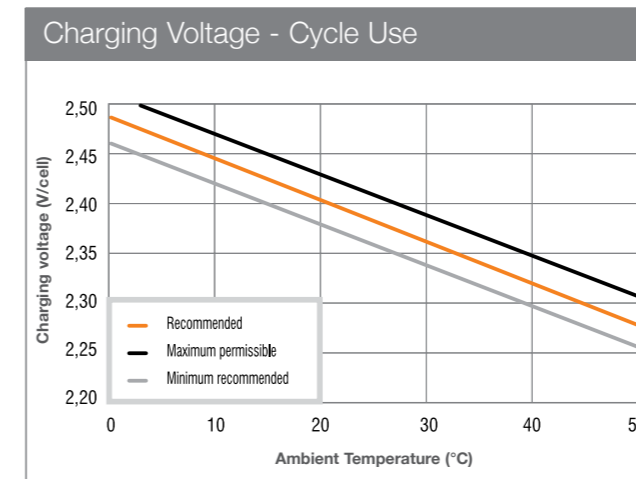
F3: Bold Fastened Terminal

**F4**

F4: Terminal

**F5**

F5: Wire and connector



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 1.85 V/cell										
	10 min	15 min	30 min	45 min	1 h	2 h	3 h	5 h	10 h	20 h
SPA 4-9.5	19.20	14.77	9.11	6.77	5.45	3.18	2.29	1.50	0.83	0.45
SPA 6-1.3	2.51	1.91	1.18	0.88	0.71	0.42	0.30	0.20	0.11	0.06
SPA 6-2.5	5.20	4.01	2.49	1.86	1.50	0.89	0.65	0.43	0.24	0.13
SPA 6-2.8	5.51	4.23	2.61	1.95	1.57	0.92	0.67	0.44	0.25	0.13
SPA 6-3.2	6.39	4.91	3.03	2.26	1.83	1.07	0.77	0.51	0.29	0.15
SPA 6-4.5	9.27	7.14	4.44	3.32	2.69	1.59	1.16	0.77	0.43	0.23
SPA 6-7	13.94	10.69	6.58	4.89	3.94	2.30	1.66	1.09	0.61	0.33
SPA 6-8	15.34	11.87	7.41	5.54	4.50	2.65	1.92	1.28	0.72	0.38
SPA 6-10	19.42	14.89	9.21	6.86	5.56	3.27	2.37	1.57	0.87	0.47
SPA 6-12	23.14	17.88	11.12	8.29	6.71	3.95	2.85	1.88	1.05	0.57
SPA 8-3.2	6.27	4.82	2.99	2.23	1.81	1.06	0.77	0.51	0.29	0.15
SPA 12-0.7	1.36	1.04	0.65	0.49	0.40	0.24	0.17	0.12	0.07	0.03
SPA 12-1.3	2.50	1.91	1.18	0.88	0.72	0.42	0.31	0.20	0.11	0.06
SPA 12-1.9	3.85	2.96	1.84	1.38	1.12	0.67	0.49	0.32	0.18	0.10
SPA 12-2C	3.10	2.39	1.50	1.13	0.92	0.55	0.40	0.27	0.15	0.08
SPA 12-2.3	4.42	3.38	2.09	1.56	1.27	0.75	0.54	0.36	0.20	0.11
SPA 12-2.3C	3.68	2.85	1.80	1.36	1.11	0.67	0.49	0.33	0.18	0.10
SPA 12-3.3	6.34	4.85	3.00	2.24	1.82	1.07	0.78	0.52	0.29	0.16
SPA 12-5	9.93	7.58	4.66	3.47	2.80	1.64	1.19	0.78	0.44	0.24
SPA 12-6	12.96	9.88	6.02	4.44	3.56	2.06	1.48	0.98	0.55	0.28
SPA 12-7	13.64	10.48	6.48	4.83	3.91	2.30	1.66	1.10	0.61	0.33
SPA 12-7.2	13.90	10.68	6.60	4.92	3.98	2.34	1.69	1.12	0.62	0.34
SPA 12-9	17.68	13.52	8.32	6.19	5.01	2.95	2.13	1.41	0.79	0.42
SPA 12-10	19.29	14.82	9.18	6.85	5.55	3.27	2.37	1.57	0.87	0.47
SPA 12-10S	19.29	14.82	9.18	6.85	5.55	3.27	2.37	1.57	0.87	0.47
SPA 12-12	23.97	18.41	11.38	8.48	6.85	4.02	2.90	1.93	1.09	0.56
SPA 12-18	33.60	26.26	16.55	12.39	10.05	5.92	4.28	2.83	1.57	0.85
SPA 12-26	46.35	36.24	22.87	17.21	13.95	8.26	6.01	3.98	2.22	1.23
SPA 12-28	52.73	41.22	25.94	19.41	15.73	9.24	6.68	4.40	2.45	1.32

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
SPA 4-9.5	21.11	16.09	9.77	7.20	5.76	3.33	2.40	1.57	0.87	0.46
SPA 6-1.3	2.73	2.06	1.25	0.93	0.75	0.44	0.31	0.21	0.12	0.06
SPA 6-2.5	5.70	4.35	2.67	1.97	1.59	0.93	0.67	0.45	0.25	0.13
SPA 6-2.8	6.03	4.59	2.79	2.07	1.66	0.97	0.70	0.46	0.26	0.14
SPA 6-3.2	6.99	5.32	3.24	2.40	1.92	1.12	0.81	0.54	0.30	0.16
SPA 6-4.5	10.14	7.73	4.74	3.51	2.84	1.67	1.21	0.80	0.45	0.24
SPA 6-7	15.26	11.59	7.03	5.19	4.16	2.41	1.74	1.14	0.63	0.34
SPA 6-8	16.85	12.90	7.93	5.89	4.74	2.78	2.01	1.34	0.75	0.39
SPA 6-10	21.19	16.11	9.82	7.28	5.86	3.42	2.48	1.63	0.91	0.49
SPA 6-12	25.43	19.45	11.90	8.83	7.09	4.14	2.99	1.96	1.10	0.59
SPA 8-3.2	6.85	5.22	3.19	2.37	1.9	1.11	0.81	0.53	0.30	0.16
SPA 12-0.7	1.47	1.12	0.69	0.52	0.42	0.25	0.18	0.12	0.07	0.04
SPA 12-1.3	2.72	2.06	1.26	0.93	0.75	0.44	0.32	0.21	0.12	0.06
SPA 12-1.9	4.19	3.19	1.96	1.46	1.18	0.70	0.51	0.34	0.19	0.10
SPA 12-2C	3.36	2.58	1.60	1.19	0.97	0.57	0.42	0.28	0.16	0.08
SPA 12-2.3	4.81	3.65	2.22	1.65	1.33	0.78	0.57	0.37	0.21	0.11
SPA 12-2.3C	4.00	3.07	1.92	1.44	1.17	0.70	0.51	0.34	0.19	0.10
SPA 12-3.3	6.90	5.23	3.19	2.37	1.91	1.12	0.81	0.54	0.30	0.16
SPA 12-5	10.81	8.19	4.97	3.67	2.95	1.72	1.24	0.82	0.46	0.24
SPA 12-6	14.18	10.71	6.43	4.70	3.76	2.16	1.55	1.02	0.57	0.29
SPA 12-7	14.92	11.35	6.92	5.13	4.12	2.41	1.74	1.14	0.64	0.34
SPA 12-7.2	15.20	11.56	7.05	5.22	4.20	2.45	1.77	1.16	0.65	0.35
SPA 12-9	19.25	14.59	8.86	6.56	5.28	3.08	2.23	1.47	0.82	0.44
SPA 12-10	21.08	16.05	9.80	7.27	5.85	3.42	2.48	1.63	0.91	0.49
SPA 12-10S	21.08	16.05	9.80	7.27	5.85	3.42	2.48	1.63	0.91	0.49
SPA 12-12	26.23	19.96	12.16	9.00	7.22	4.21	3.04	2.01	1.13	0.59
SPA 12-18	37.18	28.77	17.81	13.24	10.65	6.22	4.49	2.95	1.65	0.88
SPA 12-26	51.18	39.56	24.56	18.31	14.80	8.68	6.27	4.14	2.32	1.27
SPA 12-28	58.41	45.19	27.94	20.75	16.67	9.71	7.00	4.60	2.56	1.37

Design and/or specifications are subject to change without prior notice. For clarifications and updated information, please contact your local SUNLIGHT sales representative.

### Performance Data

Discharge Constant Current at 25°C (Amperes)

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
SPA 4-9.5	22.65	17.08	10.22	7.46	5.97	3.43	2.46	1.61	0.89	0.47
SPA 6-1.3	2.90	2.17	1.30	0.96	0.77	0.45	0.32	0.21	0.12	0.06
SPA 6-2.5	6.10	4.61	2.78	2.05	1.65	0.96	0.69	0.46	0.26	0.14
SPA 6-2.8	6.44	4.85	2.91	2.14	1.71	0.99	0.72	0.47	0.26	0.14
SPA 6-3.2	7.47	5.63	3.38	2.48	1.99	1.15	0.83	0.55	0.31	0.16
SPA 6-4.5	10.82	8.17	4.94	3.64	2.93	1.71	1.24	0.82	0.46	0.25
SPA 6-7	16.31	12.27	7.34	5.37	4.30	2.48	1.78	1.17	0.65	0.35
SPA 6-8	18.05	13.68	8.28	6.11	4.90	2.85	2.07	1.37	0.77	0.40
SPA 6-10	22.58	17.00	10.22	7.54	6.04	3.52	2.54	1.67	0.94	0.50
SPA 6-12	27.26	20.63	12.43	9.15	7.33	4.25	3.07	2.02	1.12	0.60
SPA 8-3.2	7.31	5.52	3.32	2.45	1.97	1.14	0.83	0.55	0.31	0.16
SPA 12-0.7	1.56	1.18	0.72	0.53	0.43	0.25	0.18	0.12	0.07	0.04
SPA 12-1.3	2.89	2.17	1.31	0.97	0.78	0.45	0.33	0.22	0.12	0.06
SPA 12-1.9	4.46	3.36	2.04	1.51	1.22	0.72	0.52	0.34	0.19	0.11
SPA 12-2C	3.57	2.71	1.66	1.24	1.00	0.59	0.43	0.28	0.16	0.09
SPA 12-2.3	5.11	3.84	2.31	1.71	1.37	0.80	0.58	0.38	0.21	0.11
SPA 12-2.3C	4.25	3.23	1.99	1.49	1.21	0.72	0.52	0.35	0.19	0.11
SPA 12-3.3	7.33	5.51	3.32	2.45	1.97	1.15	0.83	0.55	0.31	0.16
SPA 12-5	11.50	8.63	5.17	3.80	3.04	1.77	1.28	0.84	0.47	0.25
SPA 12-6	15.14	11.33	6.71	4.88	3.89	2.22	1.59	1.04	0.58	0.30
SPA 12-7	15.93	12.00	7.21	5.31	4.25	2.47	1.79	1.17	0.66	0.35
SPA 12-7.2	16.22	12.22	7.34	5.41	4.33	2.52	1.82	1.19	0.67	0.36
SPA 12-9	20.47	15.36	9.21	6.79	5.44	3.17	2.29	1.51	0.84	0.45
SPA 12-10	22.49	16.95	10.21	7.53	6.03	3.52	2.54	1.67	0.94	0.50
SPA 12-10S	22.49	16.95	10.21	7.53	6.03	3.52	2.54	1.67	0.94	0.50
SPA 12-12	28.02	21.12	12.69	9.31	7.47	4.33	3.12	2.06	1.16	0.60
SPA 12-18	40.17	30.72	18.68	13.77	11.04	6.39	4.62	3.03	1.69	0.90
SPA 12-26	55.14	42.14	25.72	19.05	15.30	8.93	6.46	4.25	2.39	1.30
SPA 12-28	63.14	48.28	29.32	21.57	17.29	9.98	7.20	4.72	2.63	1.40

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
SPA 4-9.5	23.81	17.79	10.51	7.65	6.11	3.49	2.51	1.64	0.91	0.48
SPA 6-1.3	3.02	2.25	1.34	0.98	0.78	0.46	0.33	0.22	0.12	0.07
SPA 6-2.5	6.39	4.79	2.86	2.09	1.68	0.98	0.70	0.46	0.26	0.14
SPA 6-2.8	6.75	5.04	2.99	2.19	1.75	1.01	0.73	0.48	0.27	0.14
SPA 6-3.2	7.84	5.85	3.48	2.54	2.04	1.18	0.85	0.56	0.32	0.16
SPA 6-4.5	11.31	8.47	5.07	3.72	2.99	1.75	1.26	0.83	0.47	0.25
SPA 6-7	17.11	12.75	7.54	5.50	4.40	2.52	1.82	1.19	0.66	0.36
SPA 6-8	18.96	14.22	8.52	6.25	5.02	2.91	2.10	1.39	0.79	0.41
SPA 6-10	23.60	17.62	10.50	7.70	6.17	3.58	2.59	1.70	0.95	0.51
SPA 6-12	28.65	21.46	12.79	9.36	7.50	4.33	3.12	2.05	1.14	0.61
SPA 8-3.2	7.66	5.72	3.41	2.50	2.01	1.17	0.84	0.56	0.31	0.16
SPA 12-0.7	1.63	1.22	0.74	0.54	0.44	0.26	0.19	0.12	0.07	0.04
SPA 12-1.3	3.01	2.25	1.34	0.99	0.79	0.46	0.33	0.22	0.12	0.07
SPA 12-1.9	4.65	3.48	2.09	1.54	1.24	0.73	0.53	0.35	0.20	0.11
SPA 12-2C	3.72	2.80	1.70	1.26	1.02	0.60	0.44	0.29	0.16	0.09
SPA 12-2.3	5.32	3.97	2.37	1.75	1.40	0.82	0.59	0.39	0.22	0.12
SPA 12-2.3C	4.43	3.34	2.04	1.52	1.23	0.73	0.53	0.35	0.20	0.11
SPA 12										

### Performance Data

Discharge Constant Current at 25°C (Amperes)

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
SPA 4-9.5	24.68	18.28	10.72	7.78	6.20	3.54	2.54	1.66	0.92	0.49
SPA 6-1.3	3.11	2.30	1.36	1.00	0.80	0.46	0.33	0.22	0.12	0.07
SPA 6-2.5	6.61	4.92	2.91	2.13	1.70	0.99	0.71	0.47	0.26	0.14
SPA 6-2.8	6.97	5.17	3.05	2.22	1.78	1.03	0.74	0.48	0.27	0.14
SPA 6-3.2	8.09	6.00	3.54	2.58	2.07	1.19	0.86	0.57	0.32	0.17
SPA 6-4.5	11.68	8.69	5.16	3.78	3.04	1.77	1.28	0.84	0.47	0.26
SPA 6-7	17.67	13.08	7.68	5.59	4.46	2.56	1.84	1.20	0.67	0.36
SPA 6-8	19.63	14.62	8.68	6.35	5.10	2.95	2.13	1.41	0.80	0.41
SPA 6-10	24.35	18.06	10.70	7.82	6.27	3.63	2.62	1.72	0.96	0.52
SPA 6-12	29.66	22.06	13.04	9.52	7.62	4.39	3.16	2.08	1.16	0.62
SPA 8-3.2	7.90	5.87	3.48	2.54	2.04	1.18	0.85	0.56	0.32	0.17
SPA 12-0.7	1.68	1.25	0.75	0.55	0.45	0.26	0.19	0.13	0.07	0.04
SPA 12-1.3	3.10	2.30	1.37	1.00	0.80	0.47	0.34	0.22	0.13	0.07
SPA 12-1.9	4.79	3.57	2.13	1.57	1.26	0.74	0.54	0.35	0.20	0.11
SPA 12-2C	3.83	2.87	1.73	1.28	1.03	0.61	0.44	0.29	0.16	0.09
SPA 12-2.3	5.48	4.07	2.42	1.77	1.42	0.83	0.60	0.39	0.22	0.12
SPA 12-2.3C	4.56	3.43	2.08	1.54	1.25	0.74	0.54	0.36	0.20	0.11
SPA 12-3.3	7.86	5.83	3.47	2.54	2.04	1.19	0.86	0.57	0.32	0.17
SPA 12-5	12.37	9.16	5.40	3.94	3.16	1.82	1.31	0.86	0.48	0.26
SPA 12-6	16.37	12.07	7.02	5.08	4.04	2.30	1.64	1.07	0.60	0.31
SPA 12-7	17.21	12.77	7.55	5.51	4.42	2.55	1.84	1.21	0.68	0.36
SPA 12-7.2	17.53	13.00	7.69	5.61	4.50	2.60	1.87	1.23	0.69	0.37
SPA 12-9	21.99	16.29	9.63	7.04	5.65	3.27	2.36	1.55	0.87	0.46
SPA 12-10	24.30	18.04	10.69	7.81	6.27	3.63	2.62	1.72	0.96	0.52
SPA 12-10S	24.30	18.04	10.69	7.81	6.27	3.63	2.62	1.72	0.96	0.52
SPA 12-12	30.35	22.52	13.28	9.69	7.76	4.47	3.22	2.12	1.20	0.62
SPA 12-18	44.33	33.17	19.67	14.36	11.49	6.62	4.76	3.12	1.74	0.93
SPA 12-26	60.53	45.34	27.04	19.85	15.89	9.21	6.66	4.38	2.46	1.34
SPA 12-28	69.73	52.17	30.88	22.52	18.00	10.34	7.43	4.86	2.71	1.44

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
SPA 4-9.5	25.30	18.66	10.88	7.88	6.27	3.58	2.56	1.67	0.93	0.50
SPA 6-1.3	3.17	2.34	1.38	1.01	0.81	0.47	0.34	0.22	0.12	0.07
SPA 6-2.5	6.77	5.01	2.95	2.16	1.72	1.00	0.72	0.47	0.26	0.14
SPA 6-2.8	7.13	5.26	3.09	2.25	1.80	1.04	0.75	0.49	0.27	0.15
SPA 6-3.2	8.29	6.11	3.59	2.62	2.09	1.21	0.87	0.57	0.32	0.17
SPA 6-4.5	11.95	8.85	5.23	3.83	3.07	1.79	1.29	0.85	0.48	0.26
SPA 6-7	18.09	13.32	7.80	5.66	4.52	2.59	1.86	1.22	0.68	0.36
SPA 6-8	20.10	14.91	8.80	6.44	5.16	2.99	2.15	1.42	0.80	0.42
SPA 6-10	24.88	18.39	10.84	7.92	6.34	3.67	2.65	1.74	0.97	0.52
SPA 6-12	30.40	22.49	13.23	9.64	7.71	4.44	3.19	2.10	1.17	0.63
SPA 8-3.2	8.08	5.98	3.53	2.58	2.06	1.19	0.86	0.57	0.32	0.17
SPA 12-0.7	1.71	1.27	0.76	0.56	0.45	0.26	0.19	0.13	0.07	0.04
SPA 12-1.3	3.16	2.34	1.38	1.01	0.81	0.47	0.34	0.23	0.13	0.07
SPA 12-1.9	4.89	3.63	2.16	1.59	1.28	0.75	0.54	0.36	0.20	0.11
SPA 12-2C	3.91	2.92	1.75	1.30	1.04	0.61	0.45	0.30	0.16	0.09
SPA 12-2.3	5.59	4.14	2.45	1.79	1.44	0.84	0.60	0.40	0.22	0.12
SPA 12-2.3C	4.65	3.48	2.11	1.56	1.27	0.75	0.54	0.36	0.20	0.11
SPA 12-3.3	8.03	5.93	3.51	2.57	2.07	1.20	0.87	0.57	0.32	0.17
SPA 12-5	12.63	9.32	5.47	3.99	3.20	1.84	1.33	0.87	0.49	0.26
SPA 12-6	16.75	12.29	7.12	5.15	4.08	2.32	1.66	1.08	0.61	0.31
SPA 12-7	17.60	13.01	7.66	5.59	4.47	2.58	1.86	1.22	0.68	0.36
SPA 12-7.2	17.92	13.25	7.80	5.68	4.55	2.63	1.89	1.24	0.69	0.37
SPA 12-9	22.45	16.58	9.76	7.13	5.71	3.30	2.38	1.57	0.88	0.47
SPA 12-10	24.84	18.37	10.84	7.91	6.34	3.67	2.65	1.74	0.97	0.52
SPA 12-10S	24.84	18.37	10.84	7.91	6.34	3.67	2.65	1.74	0.97	0.52
SPA 12-12	31.07	22.93	13.47	9.81	7.84	4.52	3.25	2.14	1.21	0.63
SPA 12-18	45.63	33.90	19.98	14.56	11.64	6.69	4.81	3.15	1.76	0.94
SPA 12-26	62.25	46.28	27.46	20.09	16.10	9.31	6.73	4.43	2.48	1.35
SPA 12-28	71.84	53.31	31.37	22.82	18.22	10.46	7.50	4.91	2.73	1.46

Design and/or specifications are subject to change without prior notice. For clarifications and updated information, please contact your local SUNLIGHT sales representative.

### Performance Data

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

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
SPA 4-9.5	50.8	34.9	27.2	17.1	12.9	10.4	6.1	4.5	2.95	1.65
SPA 6-1.3	6.9	4.6	3.6	2.2	1.7	1.4	0.8	0.6	0.39	0.22
SPA 6-2.5	13.8	9.5	7.4	4.7	3.5	2.9	1.7	1.3	0.84	0.48
SPA 6-2.8	14.8	10.1	7.8	4.9	3.7	3.0	1.8	1.3	0.86	0.49
SPA 6-3.2	17.1	11.7	9.1	5.7	4.3	3.5	2.1	1.5	1.01	0.57
SPA 6-4.5	24.9	16.9	13.2	8.4	6.3	5.1	3.1	2.3	1.51	0.86
SPA 6-7	37.4	25.5	19.8	12.4	9.3	7.5	4.5	3.2	2.15	1.20
SPA 6-8	40.4	27.9	21.9	13.9	10.5	8.6	5.1	3.7	2.51	1.43
SPA 6-10	52.5	35.5	27.6	17.4	13.1	10.6	6.3	4.6	3.07	1.73
SPA 6-12	61.0	42.1	33.0	20.9	15.7	12.8	7.6	5.6	3.70	2.08
SPA 8-3.2	16.8	11.4	8.9	5.6	4.2	3.5	2.1	1.5	1.01	0.57
SPA 12-0.7	3.7	2.5	1.9	1.2	0.9	0.8	0.5	0.3	0.23	0.13
SPA 12-1.3	6.8	4.6	3.6	2.2	1.7	1.4	0.8	0.6	0.40	0.22
SPA 12-1.9	10.4	7.1	5.5	3.5	2.6	2.1	1.3	0.9	0.63	0.36
SPA 12-2C	8.4	5.7	4.4	2.8	2.2	1.8	1.1	0.8	0.53	0.30
SPA 12-2.3	12.1	8.1	6.3	4.0	3.0	2.4	1.4	1.1	0.71	0.40
SPA 12-2.3C	9.8	6.7	5.3	3.4	2.6	2.1	1.3	0.9	0.65	0.37
SPA 12-3.3	17.4	11.6	9.0	5.7	4.3	3.5	2.1	1.5	1.01	0.57
SPA 12-5	27.2	18.2	14.1	8.8	6.6	5.4	3.2	2.3	1.54	0.87
SPA 12-6	35.2	23.7	18.3	11.4	8.5	6.8	4.0	2.9	1.92	1.08
SPA 12-7	36.6	24.9	19.4	12.2	9.2	7.5	4.4	3.2	2.16	1.21
SPA 12-7.2	37.4	25.4	19.8	12.4	9.4	7.6	4.5	3.3	2.20	1.23
SPA 12-9	48.4	32.4	25.1	15.7	11.8	9.6	5.7	4.2	2.77	1.56
SPA 12-10	51.8	35.2	27.4	17.3	13.0	10.6	6.3	4.6	3.07	1.73
SPA 12-10S	51.8	35.2	27.4	17.3	13.0	10.6	6.3	4.6	3.07	1.73
SPA 12-12	64.2	43.8	34.0	21.4	16.1	13.1	7.8	5.7	3.79	2.15
SPA 12-18	85.4	60.7	48.1	31.0	23.4	19.1	11.4	8.3	5.54	3.11
SPA 12-26	118.8	83.9	66.5	42.9	32.6	26.6	16.0	11.7	7.80	4.40
SPA 12-28	133.9	95.2	75.5	48.5	36.7	30.0	17.9	13.0	8.63	4.85

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
SPA 4-9.5	56.0	38.1	29.5	18.3	13.7	11.0	6.4	4.7	3.07	1.72
SPA 6-1.3	7.5	5.0	3.8	2.4	1.8	1.4	0.8	0.6	0.41	0.23
SPA 6-2.5	15.2	10.3	8.0	5.0	3.7	3.0	1.8	1.3	0.87	0.49
SPA 6-2.8	16.3	10.9	8.4	5.3	3.9	3.2	1.9	1.4	0.90	0.51
SPA 6-3.2	18.8	12.7	9.8	6.1	4.6	3.7	2.2	1.6	1.05	0.60
SPA 6-4.5	27.3	18.4	14.2	8.9	6.7	5.4	3.2	2.4	1.57	0.89
SPA 6-7	41.2	27.7	21.3	13.2	9.9	7.9	4.7	3.4	2.23	1.26
SPA 6-8	44.5	30.4	23.7	14.9	11.2	9.1	5.4	3.9	2.62	1.49
SPA 6-10	57.6	38.6	29.7	18.5	13.8	11.2	6.6	4.8	3.20	1.81
SPA 6-12	67.2	45.9	35.7	22.3	16.7	13.5	8.0	5.8	3.85	2.17
SPA 8-3.2	18.5	12.4	9.6	6.0	4.5	3.6	2.2	1.6	1.05	0.60
SPA 12-0.7	4.0	2.7	2.1	1.3	1.0	0.8	0.5	0.4	0.24	0.14
SPA 12-1.3	7.5	5.0	3.8	2.4	1.8	1.4	0.9	0.6	0.41	0.23
SPA 12-1.9	11.4	7.6	5.9	3.7	2.8	2.3	1.3	1.0	0.66	0.38
SPA 12-2C	9.1	6.1	4.8	3.0	2.3	1.9	1.1	0.8	0.55	0.31
SPA 12-2.3	13.2	8.8	6.8	4.2	3.1	2.6	1.5	1.1	0.73	0.41
SPA 12-2.3C	10.7	7.3	5.7	3.6	2.7	2.2	1.3	1.0	0.67	0.38
SPA 12-3.3	19.0	12.6	9.7	6.0	4.5	3.7	2.2	1.6	1.05	0.60
SPA 12-5	29.8	19.7	15.1	9.4	7.0	5.6	3.3	2.4	1.60	0.90
SPA 12-6	38.7	25.8	19.8	12.1	8.9	7.2	4.2	3.0	2.00	1.13
SPA 12-7	40.3	27.1	20.9							

### Performance Data

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

	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
SPA 4-9.5	60.6	40.7	31.2	19.1	14.1	11.4	6.6	4.8	3.15	1.77
SPA 6-1.3	8.1	5.3	4.0	2.5	1.8	1.5	0.9	0.6	0.42	0.24
SPA 6-2.5	16.4	11.0	8.4	5.2	3.9	3.1	1.9	1.3	0.89	0.51
SPA 6-2.8	17.5	11.6	8.9	5.5	4.1	3.3	1.9	1.4	0.92	0.52
SPA 6-3.2	20.3	13.5	10.3	6.4	4.7	3.8	2.2	1.6	1.08	0.61
SPA 6-4.5	29.4	19.5	15.0	9.3	6.9	5.6	3.3	2.4	1.60	0.91
SPA 6-7	44.4	29.5	22.5	13.8	10.2	8.2	4.8	3.5	2.29	1.29
SPA 6-8	48.0	32.4	25.0	15.5	11.6	9.4	5.5	4.0	2.68	1.53
SPA 6-10	62.0	40.9	31.3	19.2	14.3	11.5	6.8	5.0	3.28	1.85
SPA 6-12	72.6	49.0	37.7	23.3	17.3	14.0	8.2	6.0	3.95	2.22
SPA 8-3.2	19.9	13.2	10.1	6.2	4.6	3.8	2.2	1.6	1.07	0.61
SPA 12-0.7	4.3	2.8	2.2	1.4	1.0	0.8	0.5	0.4	0.24	0.14
SPA 12-1.3	8.0	5.3	4.0	2.5	1.8	1.5	0.9	0.6	0.43	0.24
SPA 12-1.9	12.3	8.1	6.2	3.8	2.9	2.3	1.4	1.0	0.68	0.38
SPA 12-2C	9.8	6.5	5.0	3.1	2.3	1.9	1.1	0.8	0.56	0.32
SPA 12-2.3	14.2	9.3	7.1	4.4	3.3	2.6	1.6	1.1	0.75	0.43
SPA 12-2.3C	11.5	7.7	5.9	3.7	2.8	2.3	1.4	1.0	0.69	0.39
SPA 12-3.3	20.4	13.3	10.2	6.3	4.7	3.8	2.2	1.6	1.08	0.61
SPA 12-5	32.0	20.9	15.9	9.7	7.2	5.8	3.4	2.5	1.65	0.93
SPA 12-6	41.7	27.4	20.8	12.6	9.3	7.4	4.3	3.1	2.05	1.16
SPA 12-7	43.4	28.8	22.0	13.5	10.1	8.1	4.8	3.5	2.30	1.30
SPA 12-7.2	44.2	29.3	22.5	13.8	10.3	8.3	4.9	3.5	2.34	1.32
SPA 12-9	56.9	37.2	28.4	17.4	12.9	10.4	6.1	4.5	2.96	1.67
SPA 12-10	61.3	40.7	31.2	19.2	14.3	11.5	6.8	5.0	3.28	1.85
SPA 12-10S	61.3	40.7	31.2	19.2	14.3	11.5	6.8	5.0	3.28	1.85
SPA 12-12	76.1	50.6	38.8	23.8	17.7	14.3	8.4	6.1	4.04	2.30
SPA 12-18	102.7	71.3	55.6	34.8	26.0	21.0	12.3	9.0	5.93	3.34
SPA 12-26	142.2	98.2	76.5	48.0	36.0	29.1	17.2	12.5	8.33	4.72
SPA 12-28	161.1	112.0	87.4	54.6	40.7	32.8	19.3	14.0	9.25	5.20

	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
SPA 4-9.5	64.4	42.6	32.5	19.7	14.5	11.6	6.8	4.9	3.21	1.80
SPA 6-1.3	8.5	5.5	4.2	2.5	1.9	1.5	0.9	0.6	0.42	0.24
SPA 6-2.5	17.4	11.5	8.8	5.4	4.0	3.2	1.9	1.4	0.91	0.51
SPA 6-2.8	18.6	12.2	9.2	5.6	4.1	3.3	2.0	1.4	0.94	0.53
SPA 6-3.2	21.5	14.1	10.7	6.5	4.8	3.9	2.3	1.6	1.10	0.62
SPA 6-4.5	31.1	20.4	15.5	9.5	7.1	5.7	3.4	2.5	1.63	0.92
SPA 6-7	47.1	30.8	23.4	14.2	10.4	8.4	4.9	3.5	2.33	1.31
SPA 6-8	51.0	33.9	26.0	15.9	11.8	9.6	5.6	4.1	2.73	1.56
SPA 6-10	65.6	42.6	32.4	19.7	14.6	11.8	6.9	5.0	3.34	1.88
SPA 6-12	77.2	51.3	39.2	24.0	17.7	14.3	8.4	6.1	4.02	2.26
SPA 8-3.2	21.1	13.8	10.5	6.4	4.7	3.8	2.3	1.6	1.09	0.62
SPA 12-0.7	4.6	3.0	2.3	1.4	1.0	0.8	0.5	0.4	0.24	0.14
SPA 12-1.3	8.5	5.5	4.1	2.5	1.9	1.5	0.9	0.7	0.43	0.24
SPA 12-1.9	13.0	8.4	6.4	3.9	2.9	2.4	1.4	1.0	0.69	0.39
SPA 12-2C	10.3	6.8	5.2	3.2	2.4	1.9	1.2	0.8	0.57	0.32
SPA 12-2.3	15.0	9.7	7.3	4.5	3.3	2.7	1.6	1.2	0.77	0.43
SPA 12-2.3C	12.1	8.0	6.1	3.8	2.9	2.3	1.4	1.0	0.70	0.40
SPA 12-3.3	21.5	13.9	10.5	6.4	4.8	3.8	2.3	1.7	1.10	0.62
SPA 12-5	33.8	21.8	16.5	10.0	7.4	5.9	3.5	2.5	1.67	0.94
SPA 12-6	44.3	28.6	21.6	13.0	9.5	7.6	4.4	3.2	2.08	1.17
SPA 12-7	46.0	30.0	22.8	13.9	10.3	8.3	4.9	3.5	2.34	1.32
SPA 12-7.2	46.9	30.6	23.3	14.2	10.5	8.5	5.0	3.6	2.38	1.34
SPA 12-9	60.1	38.7	29.3	17.8	13.2	10.6	6.2	4.5	3.01	1.69
SPA 12-10	64.9	42.4	32.3	19.7	14.6	11.8	6.9	5.0	3.34	1.88
SPA 12-10S	64.9	42.4	32.3	19.7	14.6	11.8	6.9	5.0	3.34	1.88
SPA 12-12	80.7	52.9	40.2	24.5	18.1	14.6	8.5	6.2	4.11	2.34
SPA 12-18	109.7	75.1	58.0	35.9	26.6	21.5	12.6	9.1	6.03	3.39
SPA 12-26	151.6	103.2	79.7	49.4	36.8	29.7	17.6	12.8	8.47	4.80
SPA 12-28	172.2	118.0	91.2	56.3	41.7	33.6	19.7	14.2	9.40	5.28

Design and/or specifications are subject to change without prior notice. For clarifications and updated information, please contact your local SUNLIGHT sales representative.

### Performance Data

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

	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
SPA 4-9.5	67.6	44.1	33.3	20.1	14.7	11.8	6.8	4.9	3.25	1.82
SPA 6-1.3	8.9	5.6	4.2	2.6	1.9	1.5	0.9	0.6	0.43	0.24
SPA 6-2.5	18.2	11.8	9.0	5.5	4.0	3.2	1.9	1.4	0.92	0.52
SPA 6-2.8	19.4	12.5	9.5	5.7	4.2	3.4	2.0	1.4	0.95	0.53
SPA 6-3.2	22.5	14.5	11.0	6.6	4.9	3.9	2.3	1.7	1.11	0.63
SPA 6-4.5	32.5	21.0	15.9	9.7	7.2	5.8	3.4	2.5	1.65	0.93
SPA 6-7	49.3	31.7	24.0	14.4	10.6	8.5	5.0	3.6	2.36	1.33
SPA 6-8	53.5	35.1	26.7	16.2	12.0	9.7	5.7	4.1	2.76	1.57
SPA 6-10	68.4	43.9	33.2	20.1	14.8	12.0	7.0	5.1	3.38	1.91
SPA 6-12	81.0	53.0	40.2	24.4	18.0	14.5	8.5	6.2	4.07	2.29
SPA 8-3.2	22.0	14.2	10.8	6.5	4.8	3.9	2.3	1.7	1.10	0.63
SPA 12-0.7	4.7	3.0	2.3	1.4	1.0	0.9	0.5	0.4	0.25	0.14
SPA 12-1.3	8.8	5.6	4.2	2.6	1.9	1.5	0.9	0.7	0.44	0.25
SPA 12-1.9	13.5	8.7	6.6	4.0	3.0	2.4	1.4	1.0	0.69	0.39
SPA 12-2C	10.7	6.9	5.3	3.3	2.4	2.0	1.2	0.9	0.58	0.33
SPA 12-2.3	15.6	9.9	7.5	4.5	3.4	2.7	1.6	1.2	0.77	0.44
SPA 12-2.3C	12.6	8.2	6.3	3.9	2.9	2.4	1.4	1.0	0.71	0.40
SPA 12-3.3	22.4	14.3	10.8	6.5	4.8	3.9	2.3	1.7	1.11	0.63
SPA 12-5	35.2	22.4	16.9	10.2	7.5	6.0	3.5	2.6	1.69	0.95
SPA 12-6	46.2	29.5	22.1	13.2	9.6	7.7	4.4	3.2	2.10	1.19
SPA 12-7	48.0	31.0	23.4	14.2	10.5	8.4	4.9	3.6	2.37	1.33
SPA 12-7.2	49.0	31.6	23.8	14.4	10.7	8.6	5.0	3.6	2.41	1.36
SPA 12-9	62.6	39.9	30.0	18.1	13.4	10.8	6.3	4.6	3.04	1.72
SPA 12-10	67.8	43.8	33.1	20.1	14.8	12.0	7.0	5.1	3.38	1.91
SPA 12-10S	67.8	43.8	33.1	20.1	14.8	12.0	7.0	5.1	3.38	1.91
SPA 12-12	84.5	54.5	41.2	24.9	18.4	14.8	8.6	6.3	4.16	2.37
SPA 12-18	115.7	78.0	59.8	36.6	27.1	21.8	12.8	9.2	6.11	3.44
SPA 12-26	159.6	107.0	82.0	50.4	37.4	30.2	17.8	12.9	8.58	4.85
SPA 12-28	181.7	122.7	94.0	57.4	42.4	34.2	19.9	14.4	9.52	5.35

	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
SPA 4-9.5	70.1	45.1	34.0	20.4	14.9	12.0	6.9	5.0	3.28	1.84
SPA 6-1.3	9.1	5.8	4.3	2.6	1.9	1.5	0.9	0.7	0.43	0.25
SPA 6-2.5	18.9	12.1	9.2	5.5	4.1	3.3	1.9	1.4	0.93	0.52
SPA 6-2.8	20.1	12.8	9.6	5.8	4.3	3.4	2.0	1.5	0.96	0.54
SPA 6-3.2	23.3	14.9	11.2	6.7	5.0	4.0	2.3	1.7	1.12	0.64
SPA 6-4.5	33.6	21.5	16.2	9.8	7.3	5.9	3.5	2.5	1.67	0.94
SPA 6-7	51.0	32.5	24.4	14.6	10.7	8.6	5.0	3.6	2.38	1.34
SPA 6-8	55.5	35.9	27.2	16.5	12.2	9.8	5.8	4.2	2.78	1.59
SPA 6-10	70.7	44.9	33.8	20.4	15.0	12.1	7.1	5.1	3.41	1.92
SPA 6-12	84.0	54.2	41.0	24.7	18.2	14.7	8.6	6.2	4.11	2.31
SPA 8-3.2	22.8	14.5	11.0	6.6	4.9	3.9	2.3	1.7	1.11	0.64
SPA 12-0.7	4.9	3.1	2.3	1.4	1.1	0.9	0.5	0.4	0.25	0.14
SPA 12-1.3	9.1	5.7	4.3	2.6	1.9	1.6	0.9	0.7	0.44	0.25
SPA 12-1.9	13.9	8.8	6.7	4.1	3.0	2.4	1.4	1.1	0.70	0.40
SPA 12-2C	11.1	7.1	5.4	3.3	2.5	2.0	1.2	0.9	0.58	0.33
SPA 12-2.3	16.1	10.1	7.6	4.6	3.4	2.8	1.6	1.2	0.78	0.44
SPA 12-2.3C	13.0	8.4	6.4	3.9	3.0	2.4	1.4	1.1	0.71	0.40
SPA 12-3.3	23.0	14.6	10.9	6.6	4.9	3.9	2.3	1.7	1.12	0.63
SPA 12-5	36.3	22.9	17.2	10.3	7.6	6.1	3.6	2.6	1.71	0.96
SPA 12-6	47.6	30.2	22.5	13.4	9.8	7.8	4.5	3.2	2.12	1.20
SPA 12-7	49.7	31.6	23.8	14.4	10.6	8.5	5.0	3.6	2.39	1.35
SPA 12-7.2	50.6	32.2	24.3	14.6	10.8	8.7	5.1	3.7	2.44	1.37
SPA 12-9	64.5	40.7	30.5	18.4	13.5	1				

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