Ni-Cd block battery

Dimensional and electrical data

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saft

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Contents

Saft nickel-cadmium batteries

Nickel-cadmium pocket plate batteries for all applications where reliability is of the utmost importance. Saft batteries offer the advantages of an all welded pocket plate design:

- **outstanding resistance to electrical and mechanical abuse**
- **long service life**
- **very good charge retention**
- **operation over a wide temperature range**
- **minor maintenance demands**
- **long shelf life**

Rate discharge

Three type series SBH, SBM and SBL with different performance characteristics and covering a wide capacity range permit selection of a Saft battery for any application.

H Range

The H range uses very thin plates and is designed for applications where there is a demand for a relatively high current over short periods, usually less than 30 minutes in duration. The applications can have frequent or infrequent discharges. The range is typically used in starting and power back up applications.

M Range

The M range is designed for applications where the batteries are usually required to sustain electrical loads for between 30 minutes to 3 hours or for "mixed" loads which involve a mixture of high and low discharge rates. The applications can have frequent or infrequent discharges. The range is typically used in power backup applications.

L Range

The L range has the thickest plates and is designed for applications where the battery is required to provide a reliable source of energy over relatively long discharge periods. Normally, the current is relatively low in comparison with the total stored energy and the discharges are generally infrequent.
Typical uses are power backup and bulk energy storage.

Performance Data

Many nickel-cadmium batteries are used in stationary standby power applications where discharges occur infrequently and the battery is continuously charged by a float or constant potential charge.
Under these circumstances there is a modification in the level of the discharge curve and allowances must be made for this when sizing the battery.

In order to simplify this process, the data Saft supplies in this publication has both the fully charged data to IEC 60623 and the fully charged data after prolonged float charge, which can be used directly in battery sizing calculations.

This phenomenon occurs with all nickel-cadmium batteries, but some other manufacturers of nickel-cadmium batteries may not take this effect into account in published data.

When calculating for deep discharges (0.65 V and 0.85 V) it is not necessary to take this effect into account.

Environmentally safe

More than 99% of the metals contained in each nickel-cadmium battery can be recycled, and Saft operates a dedicated recycling center to recover the nickel, cadmium, steel and plastic used in the battery.

Block battery construction features

Connector covers
Material: plastic.

Flame arresting vents
Material: polypropylene.

Cell container
Material: translucent polypropylene.

Plate tab
Spot-welded both to the plate side frames and to the upper edge of the pocket plate.

Plate group bus
Connects the plate tabs with the terminal post. Plate tabs and terminal post are projection welded to the plate group bus.

Separating grids
Separate the plates and insulate the plate frames from each other. The grids allow free circulation of electrolyte between the plates.

Plate frame
Seals the plate pockets and serves as a current collector.

Plate
Horizontal pockets of double-perforated steel strips.

Electrolyte
An alkaline solution of potassium hydroxide (KOH) which does not corrode steel.

Dimensions

Cell dimensions **H** type

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (mm)					Approx. weight per cell (kg)	Approx. electrolyte volume between level marks (cm^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (kg)	Liquid (l)	
SBH 8.3	8.3	264	123		53	77	1.10	80	0.12	0.36	M 6
SBH 12	12	264	123		64	94	1.50	110	0.14	0.44	M 6
SBH 16	16	264	123		74	108	1.80	120	0.16	0.48	M 6
SBH 19	19	349	195		57	82	2.60	190	0.25	0.77	M 6
SBH 29	29	349	195		69	100	3.40	240	0.31	0.95	M 6
SBH 39	39	349	195		79	115	4.10	280	0.36	1.1	M 8
SBH 49	49	349	195		94	137	5.20	330	0.42	1.3	M 8
SBH 59	59	349	195		103	151	5.60	380	0.49	1.5	M 10
SBH 69	69	349	195		127	187	6.40	500	0.58	1.8	M 10
SBH 79	79	349	195		127	187	7.00	500	0.58	1.8	M 10
SBH 88	88	349	195		159	232	7.90	590	0.74	2.3	M 10
SBH 98	98	349	195		159	232	8.50	590	0.71	2.2	M 10
SBH 118	118	349	195		183	268	9.60	700	0.87	2.7	M 10
SBH 137	137	349	195		252	372	12.0	1000	1.20	3.7	2 x M 10
SBH 157	157	349	195		252	372	13.5	1000	1.20	3.7	2 x M 10
SBH 177	177	349	195	159			16.5	1200	1.46	4.5	2 x M 10
SBH 196	196	349	195	159			17.0	1200	1.42	4.4	2 x M 10
SBH 236	236	349	195	183			20.0	1400	1.84	5.7	2 x M 10
SBH 265	265	349	195	232			25.5	1800	2.20	6.8	3 x M 10
SBH 294	294	349	195	232			26.0	1700	2.10	6.5	3 x M 10
SBH 353	353	349	195	268			31.5	2100	2.78	8.6	3 x M 10
SBH 393	393	349	195	304			36.0	2300	2.82	8.7	4 x M 10
SBH 471	471	349	195	352			40.5	2800	3.69	11.4	4 x M 10
SBH 491	491	349	195	377			45.5	2900	3.53	10.9	5 x M 10
SBH 590	590	349	195	437			50.5	3500	4.63	14.3	5 x M 10
SBH 640	640	405	195	377			52.5	2900	4.21	13.0	5 x M 10
SBH 705	705	405	195	437			57.5	3500	5.31	16.4	5 x M 10
SBH 765	765	405	195	437			60.0	3500	5.24	16.2	5 x M 10
SBH 865	865	405	195	497			68.5	4000	5.92	18.3	6 x M 10
SBH 920	920	405	195	522			72.0	4200	6.28	19.4	6 x M 10

* Value for initial filling (E22).

Cell dimensions **M** type

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (mm)					Approx. weight per cell (kg)	Approx. electrolyte volume between level marks (cm^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (kg)	Liquid (l)	
SBM 11	11	194	123		64	94	0.90	110	0.10	0.30	M 6
SBM 15	15	194	123		74	108	1.20	120	0.11	0.33	M 6
SBM 22	22	264	123		64	94	1.50	110	0.15	0.46	M 6
SBM 30	30	264	123		74	108	1.80	120	0.15	0.46	M 6
SBM 43	43	349	195		69	100	3.40	240	0.31	0.95	M 6
SBM 56	56	405	195		69	100	4.00	240	0.36	1.1	M 6
SBM 65	65	349	195		79	115	4.10	280	0.32	1.0	M 8
SBM 84	84	405	195		79	115	4.90	280	0.39	1.2	M 8
SBM 112	112	405	195		94	137	6.30	330	0.45	1.4	M 8
SBM 138	138	405	195		115	169	7.60	430	0.55	1.7	M 10
SBM 161	161	405	195		127	187	8.40	500	0.61	1.9	M 10
SBM 184	184	405	195		159	232	9.90	590	0.78	2.4	M 10
SBM 208	208	405	195		183	268	11.5	700	0.94	2.9	M 10
SBM 231	231	405	195		183	268	12.0	700	0.94	2.9	M 10
SBM 277	277	405	195		228	336	14.5	860	1.13	3.5	2 x M 10
SBM 300	300	405	195		240	354	15.5	860	1.20	3.7	2 x M 10
SBM 323	323	405	195		252	372	16.5	1000	1.26	3.9	2 x M 10
SBM 346	346	405	195	146	278		17.5	1100	1.42	4.4	2 x M 10
SBM 369	369	405	195	159	304		19.5	1200	1.55	4.8	2 x M 10
SBM 392	392	405	195	171	328		21.0	1300	1.72	5.3	2 x M 10
SBM 415	415	405	195	183			23.0	1400	1.88	5.8	2 x M 10
SBM 438	438	405	195	183			23.5	1400	1.88	5.8	2 x M 10
SBM 461	461	405	195	183			24.0	1400	1.84	5.7	2 x M 10
SBM 505	505	405	195	213			27.5	1600	2.10	6.5	3 x M 10
SBM 555	555	405	195	232			30.0	1800	2.33	7.2	3 x M 10
SBM 625	625	405	195	268			34.5	2100	2.82	8.7	3 x M 10
SBM 690	690	405	195	268			36.0	2100	2.78	8.6	3 x M 10
SBM 740	740	405	195	304			40.0	2400	3.11	9.6	4 x M 10
SBM 830	830	405	195	352			46.0	2800	3.79	11.7	4 x M 10
SBM 920	920	405	195	352			48.0	2800	3.82	11.8	4 x M 10
SBM 965	965	405	195	372			50.5	3000	3.69	11.4	6 x M 10
SBM 1040	1040	405	195	437			57.5	3500	4.72	14.6	5 x M 10
SBM 1150	1150	405	195	437			60.0	3500	4.66	14.4	5 x M 10
SBM 1220	1220	405	195	510			67.5	4100	5.50	17.0	6 x M 10
SBM 1390	1390	405	195	522			72.0	4200	5.60	17.3	6 x M 10

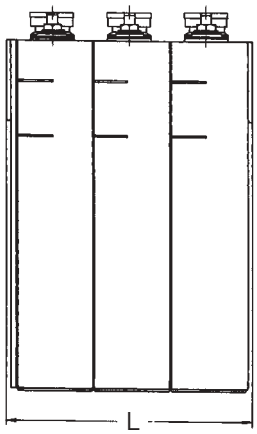
* Value for initial filling (E22).

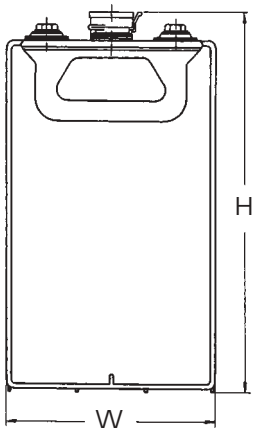
Cell dimensions **L** type

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (mm)					Approx. weight per cell (kg)	Approx. electrolyte volume between level marks (cm^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (kg)	Liquid (l)	
SBL 7.5	7.5	194	123		53	77	0.80	80	0.08	0.24	M 6
SBL 16	16	264	123		53	77	1.10	80	0.11	0.35	M 6
SBL 30	30	264	123		74	108	1.80	120	0.15	0.46	M 6
SBL 37	37	349	195		57	82	2.60	190	0.22	0.69	M 6
SBL 45	45	264	123		98	144	2.50	160	0.19	0.59	M 6
SBL 48	48	405	195		57	82	3.20	190	0.28	0.86	M 6
SBL 59	59	264	123		122	180	3.20	200	0.23	0.70	M 6
SBL 70	70	349	195		79	115	4.10	280	0.32	1.0	M 8
SBL 90	90	405	195		79	115	4.90	280	0.39	1.2	M 8
SBL 102	102	349	195		103	151	5.60	380	0.39	1.2	M 10
SBL 131	131	405	195		103	151	6.70	380	0.49	1.5	M 10
SBL 173	173	405	195		127	187	8.40	500	0.65	2.0	M 10
SBL 214	214	405	195		159	232	9.90	590	0.74	2.3	M 10
SBL 256	256	405	195		183	268	11.5	700	0.94	2.9	M 10
SBL 304	304	405	195		228	336	14.5	860	1.13	3.5	2 x M 10
SBL 346	346	405	195		252	372	16.5	1000	1.26	3.9	2 x M 10
SBL 387	387	405	195	146	278		17.5	1100	1.36	4.2	2 x M 10
SBL 429	429	405	195	159	304		19.5	1200	1.49	4.6	2 x M 10
SBL 470	470	405	195	171	328		21.0	1300	1.68	5.2	2 x M 10
SBL 510	510	405	195	183			23.0	1400	1.88	5.8	2 x M 10
SBL 600	600	405	195	219			28.0	1700	2.14	6.6	3 x M 10
SBL 645	645	405	195	232			30.0	1800	2.23	6.9	3 x M 10
SBL 770	770	405	195	268			34.5	2100	2.78	8.6	3 x M 10
SBL 860	860	405	195	304			40.0	2400	2.98	9.2	4 x M 10
SBL 1020	1020	405	195	352			46.0	2800	3.72	11.5	4 x M 10
SBL 1070	1070	405	195	377			49.5	3000	3.72	11.5	5 x M 10
SBL 1280	1280	405	195	437			57.5	3500	4.66	14.4	5 x M 10
SBL 1450	1450	405	195	497			66.0	4000	5.31	16.4	6 x M 10
SBL 1540	1540	405	195	522			69.0	4200	5.60	17.3	6 x M 10

* Value for initial filling (E22).

The dimensions of all availabe cell types are listed in the tables. There are two different cell widths, each of which comes in two heights. The block length is determined by the cell length and the number of cells in the block.



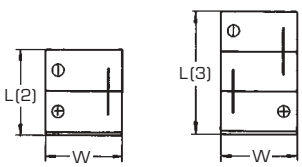


Please note:

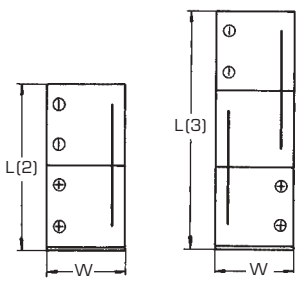
- all the tabulated dimensions are maximum values.
- all block types with a cell weight exceeding 8.4 kg (18.5 lbs) have handles.
  The tabulated block length includes 6 mm for handles for these types.
- for series connection of blocks on racks, always use blocks with an even number of cells. This gives short, straight interblock connectors. When a block with odd number of cells is necessary, it should be placed at the end of a cell row.

Position of terminals

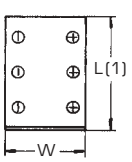
- Blocks of cells with single pole bolts
  SBH 8.3 → 118
  SBM 11 → 231
  SBL 7.5 → 256



- Blocks of cells with double pole bolts
  SBH 137,157
  SBM 277 → 392
  SBL 304 → 470



- Blocks of cells with 2 - 6 poles bolts per pole.
  Crosswise mounted on the racks
  SBH 177 → 920
  SBM 415 → 1390
  SBL 510 → 1540



Dimensions (Anglo-saxon units)

Cell dimensions **H** type (Anglo-saxon units)

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (in)					Approx. weight per cell (lbs.)	Approx. electrolyte volume between level marks (in^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (lbs.)	Liquid (US gal.)	
SBH 8.3	8.3	10.4	4.85		2.09	3.03	2.43	4.88	0.26	0.10	M 6
SBH 12	12	10.4	4.85		2.52	3.70	3.31	6.71	0.31	0.12	M 6
SBH 16	16	10.4	4.85		2.92	4.26	3.97	7.32	0.35	0.13	M 6
SBH 19	19	13.8	7.68		2.25	3.23	5.73	11.6	0.55	0.20	M 6
SBH 29	29	13.8	7.68		2.72	3.94	7.50	14.6	0.68	0.25	M 6
SBH 39	39	13.8	7.68		3.11	4.53	9.04	17.1	0.79	0.29	M 8
SBH 49	49	13.8	7.68		3.70	5.40	11.5	20.1	0.93	0.34	M 8
SBH 59	59	13.8	7.68		4.06	5.95	12.3	23.2	1.08	0.40	M 10
SBH 69	69	13.8	7.68		5.00	7.37	14.1	30.5	1.28	0.48	M 10
SBH 79	79	13.8	7.68		5.00	7.37	15.4	30.5	1.28	0.48	M 10
SBH 88	88	13.8	7.68		6.26	9.14	17.4	36.0	1.63	0.61	M 10
SBH 98	98	13.8	7.68		6.26	9.14	18.7	36.0	1.57	0.58	M 10
SBH 118	118	13.8	7.68		7.21	10.6	21.2	42.7	1.92	0.71	M 10
SBH 137	137	13.8	7.68		9.93	14.7	26.5	61.0	2.65	0.98	2 x M 10
SBH 157	157	13.8	7.68		9.93	14.7	29.8	61.0	2.65	0.98	2 x M 10
SBH 177	177	13.8	7.68	6.26			36.4	73.2	3.22	1.19	2 x M 10
SBH 196	196	13.8	7.68	6.26			37.5	73.2	3.13	1.16	2 x M 10
SBH 236	236	13.8	7.68	7.21			44.1	85.4	4.06	1.50	2 x M 10
SBH 265	265	13.8	7.68	9.14			56.2	110	4.85	1.80	3 x M 10
SBH 294	294	13.8	7.68	9.14			57.3	104	4.63	1.72	3 x M 10
SBH 353	353	13.8	7.68	10.6			69.5	128	6.13	2.27	3 x M 10
SBH 393	393	13.8	7.68	12.0			79.4	140	6.22	2.30	4 x M 10
SBH 471	471	13.8	7.68	13.9			89.3	171	8.14	3.01	4 x M 10
SBH 491	491	13.8	7.68	14.9			100	177	7.78	2.88	5 x M 10
SBH 590	590	13.8	7.68	17.2			111	214	10.21	3.78	5 x M 10
SBH 640	640	16.0	7.68	14.9			116	177	9.28	3.43	5 x M 10
SBH 705	705	16.0	7.68	17.2			127	214	11.7	4.33	5 x M 10
SBH 765	765	16.0	7.68	17.2			132	214	11.6	4.28	5 x M 10
SBH 865	865	16.0	7.68	19.6			151	244	13.1	4.83	6 x M 10
SBH 920	920	16.0	7.68	20.6			159	256	13.8	5.12	6 x M 10

* Value for initial filling (E22).

Cell dimensions **M** type (Anglo-saxon units)

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (in)					Approx. weight per cell (lbs.)	Approx. electrolyte volume between level marks (in^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (lbs.)	Liquid (US gal.)	
SBM 11	11	7.64	4.85		2.52	3.70	1.98	6.71	0.22	0.08	M 6
SBM 15	15	7.64	4.85		2.92	4.26	2.65	7.32	0.24	0.09	M 6
SBM 22	22	10.4	4.85		2.52	3.70	3.31	6.71	0.33	0.12	M 6
SBM 30	30	10.4	4.85		2.92	4.26	3.97	7.32	0.33	0.12	M 6
SBM 43	43	13.8	7.68		2.72	3.94	7.50	14.6	0.68	0.25	M 6
SBM 56	56	16.0	7.68		2.72	3.94	8.82	14.6	0.79	0.29	M 6
SBM 65	65	13.8	7.68		3.11	4.53	9.04	17.1	0.71	0.26	M 8
SBM 84	84	16.0	7.68		3.11	4.53	10.8	17.1	0.86	0.32	M 8
SBM 112	112	16.0	7.68		3.70	5.40	13.9	20.1	0.99	0.37	M 8
SBM 138	138	16.0	7.68		4.53	6.66	16.8	26.2	1.21	0.45	M 10
SBM 161	161	16.0	7.68		5.00	7.37	18.5	30.5	1.35	0.50	M 10
SBM 184	184	16.0	7.68		6.26	9.14	21.8	36.0	1.72	0.63	M 10
SBM 208	208	16.0	7.68		7.21	10.6	25.4	42.7	2.07	0.77	M 10
SBM 231	231	16.0	7.68		7.21	10.6	26.5	42.7	2.07	0.77	M 10
SBM 277	277	16.0	7.68		8.98	13.2	32.0	52.5	2.49	0.92	2 x M 10
SBM 300	300	16.0	7.68		9.46	13.9	34.2	52.5	2.65	0.98	2 x M 10
SBM 323	323	16.0	7.68		9.93	14.7	36.4	61.0	2.78	1.03	2 x M 10
SBM 346	346	16.0	7.68	5.75	11.0		38.6	67.1	3.13	1.16	2 x M 10
SBM 369	369	16.0	7.68	6.26	12.0		43.0	73.2	3.42	1.27	2 x M 10
SBM 392	392	16.0	7.68	6.74	12.9		46.3	79.3	3.79	1.40	2 x M 10
SBM 415	415	16.0	7.68	7.21			50.7	85.4	4.15	1.53	2 x M 10
SBM 438	438	16.0	7.68	7.21			51.8	85.4	4.15	1.53	2 x M 10
SBM 461	461	16.0	7.68	7.21			52.9	85.4	4.06	1.50	2 x M 10
SBM 505	505	16.0	7.68	8.39			60.6	97.6	4.63	1.72	3 x M 10
SBM 555	555	16.0	7.68	9.14			66.2	110	5.14	1.90	3 x M 10
SBM 625	625	16.0	7.68	10.6			76.1	128	6.22	2.30	3 x M 10
SBM 690	690	16.0	7.68	10.6			79.4	128	6.13	2.27	3 x M 10
SBM 740	740	16.0	7.68	12.0			88.2	146	6.86	2.53	4 x M 10
SBM 830	830	16.0	7.68	13.9			101	171	8.36	3.09	4 x M 10
SBM 920	920	16.0	7.68	13.9			106	171	8.42	3.12	4 x M 10
SBM 965	965	16.0	7.68	14.7			111	183	8.14	3.01	6 x M 10
SBM 1040	1040	16.0	7.68	17.2			127	214	10.41	3.85	5 x M 10
SBM 1150	1150	16.0	7.68	17.2			132	214	10.28	3.80	5 x M 10
SBM 1220	1220	16.0	7.68	20.1			149	250	12.1	4.49	6 x M 10
SBM 1390	1390	16.0	7.68	20.6			159	256	12.3	4.57	6 x M 10

* Value for initial filling (E22).

Cell dimensions **L** type (Anglo-saxon units)

Cell type	Capacity at the 5hr rate (Ah)	Block dimensions (in)					Approx. weight per cell (lbs.)	Approx. electrolyte volume between level marks (in^3)	Electrolyte per cell		Cell connection bolt per pole
		H	W	L(1)	L(2)	L(3)			Solid* (lbs.)	Liquid (US gal.)	
SBL 7.5	7.5	7.64	4.85		2.09	3.03	1.76	4.88	0.18	0.06	M 6
SBL 16	16	10.4	4.85		2.09	3.03	2.43	4.88	0.24	0.09	M 6
SBL 30	30	10.4	4.85		2.92	4.26	3.97	7.32	0.33	0.12	M 6
SBL 37	37	13.8	7.68		2.25	3.23	5.73	11.6	0.49	0.18	M 6
SBL 45	45	10.4	4.85		3.86	5.67	5.51	9.76	0.42	0.16	M 6
SBL 48	48	16.0	7.68		2.25	3.23	7.06	11.6	0.62	0.23	M 6
SBL 59	59	10.4	4.85		4.81	7.09	7.06	12.2	0.51	0.18	M 6
SBL 70	70	13.8	7.68		3.11	4.53	9.04	17.1	0.71	0.26	M 8
SBL 90	90	16.0	7.68		3.11	4.53	10.8	17.1	0.86	0.32	M 8
SBL 102	102	13.8	7.68		4.06	5.95	12.3	23.2	0.86	0.32	M 10
SBL 131	131	16.0	7.68		4.06	5.95	14.8	23.2	1.08	0.40	M 10
SBL 173	173	16.0	7.68		5.00	7.37	18.5	30.5	1.43	0.53	M 10
SBL 214	214	16.0	7.68		6.26	9.14	21.8	36.0	1.63	0.61	M 10
SBL 256	256	16.0	7.68		7.21	10.6	25.4	42.7	2.07	0.77	M 10
SBL 304	304	16.0	7.68		8.98	13.2	32.0	52.5	2.49	0.92	2 x M 10
SBL 346	346	16.0	7.68		9.93	14.7	36.4	61.0	2.78	1.03	2 x M 10
SBL 387	387	16.0	7.68	5.75	11.0		38.6	67.1	3.00	1.11	2 x M 10
SBL 429	429	16.0	7.68	6.26	12.0		43.0	73.2	3.29	1.21	2 x M 10
SBL 470	470	16.0	7.68	6.74	12.9		46.3	79.3	3.70	1.37	2 x M 10
SBL 510	510	16.0	7.68	7.21			50.7	85.4	4.15	1.53	2 x M 10
SBL 600	600	16.0	7.68	8.63			61.7	104	4.72	1.74	3 x M 10
SBL 645	645	16.0	7.68	9.14			66.2	110	4.92	1.82	3 x M 10
SBL 770	770	16.0	7.68	10.6			76.1	128	6.13	2.27	3 x M 10
SBL 860	860	16.0	7.68	12.0			88.2	146	6.57	2.43	4 x M 10
SBL 1020	1020	16.0	7.68	13.9			101	171	8.20	3.04	4 x M 10
SBL 1070	1070	16.0	7.68	14.9			109	183	8.20	3.04	5 x M 10
SBL 1280	1280	16.0	7.68	17.2			127	214	10.28	3.80	5 x M 10
SBL 1450	1450	16.0	7.68	19.6			146	244	11.71	4.33	6 x M 10
SBL 1540	1540	16.0	7.68	20.6			152	256	12.35	4.57	6 x M 10

* Value for initial filling (E22).

H Range

Cell performance **H** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	0.97	1.54	2.51	3.66	4.74	6.24	8.32	9.68	10.7	11.9	14.6	22.7	26.4	32.2	38.6
SBH 12	12	1.40	2.22	3.62	5.29	6.86	9.02	12.0	14.0	15.4	17.2	21.1	32.8	38.2	46.5	55.8
SBH 16	16	1.87	2.96	4.83	7.05	9.14	12.0	16.0	18.7	20.6	22.9	28.1	43.7	51.0	62.0	74.4
SBH 19	19	2.22	3.52	5.76	8.42	10.9	14.5	19.5	22.8	25.1	27.8	33.9	52.6	60.9	76.0	79.8
SBH 29	29	3.39	5.37	8.79	12.8	16.6	22.1	29.8	34.8	38.3	42.4	51.8	80.3	92.9	116.0	122
SBH 39	39	4.56	7.22	11.8	17.3	22.3	29.7	40.1	46.8	51.5	57.0	69.6	108	125	156	164
SBH 49	49	5.73	9.07	14.8	21.7	28.1	37.3	50.4	58.8	64.6	71.6	87.5	136	157	196	206
SBH 59	59	6.90	10.9	17.9	26.1	33.8	44.9	60.7	70.7	77.8	86.3	105	163	189	236	248
SBH 69	69	8.07	12.8	20.9	30.6	39.5	52.6	71.0	82.7	91.0	101	123	191	221	276	290
SBH 79	79	9.24	14.6	23.9	35.0	45.3	60.2	81.3	94.7	104	115	141	219	253	316	332
SBH 88	88	10.3	16.3	26.7	39.0	50.4	67.0	90.5	106	116	129	157	244	282	352	370
SBH 98	98	11.5	18.1	29.7	43.4	56.2	74.6	101	118	129	143	175	271	314	392	412
SBH 118	118	13.8	21.8	35.8	52.3	67.6	89.9	121	141	156	173	211	327	378	472	496
SBH 137	137	16.0	25.3	41.5	60.7	78.5	104	141	164	181	200	245	380	439	548	576
SBH 157	157	18.4	29.0	47.6	69.6	90.0	120	162	188	207	230	280	435	503	628	660
SBH 177	177	20.7	32.7	53.6	78.4	101	135	182	212	234	259	316	490	567	708	744
SBH 196	196	22.9	36.3	59.4	86.8	112	149	202	235	259	287	350	543	628	784	824
SBH 236	236	27.6	43.7	71.5	105	135	180	243	283	311	345	421	654	756	944	992
SBH 265	265	31.0	49.0	80.3	117	152	202	273	318	350	387	473	734	849	1060	1113
SBH 294	294	34.4	54.4	89.1	130	168	224	302	353	388	430	525	814	942	1176	1235
SBH 353	353	41.3	65.3	107	156	202	269	363	423	466	516	630	978	1131	1412	1483
SBH 393	393	46.0	72.7	119	174	225	299	404	471	518	575	702	1089	1260	1572	1651
SBH 471	471	55.1	87.1	143	209	270	359	485	565	621	689	841	1305	1510	1884	1979
SBH 491	491	57.4	90.8	149	218	281	374	505	589	648	718	877	1360	1574	1964	2063
SBH 590	590	69.0	109	179	261	338	449	607	707	778	863	1054	1634	1891	2360	2479
SBH 640	640	74.9	118	193	283	366	481	645	744	814	890	1085	1614	1850	2177	2254
SBH 705	705	82.5	130	213	312	403	530	710	820	897	981	1195	1778	2038	2399	2483
SBH 765	765	89.5	142	231	338	438	575	770	890	973	1064	1297	1929	2212	2603	2694
SBH 865	865	101	160	261	382	495	650	871	1006	1100	1203	1467	2181	2501	2943	3046
SBH 920	920	108	170	278	407	526	692	927	1070	1170	1280	1560	2320	2660	3130	3240

Cell performance **H** range for stationary applications:

Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.00	1.59	2.61	3.84	5.02	7.06	10.8	12.4	13.8	15.5	18.6	28.2	32.8	41.5	43.7
SBH 12	12	1.45	2.30	3.78	5.56	7.26	10.2	15.6	18.0	20.0	22.3	26.9	40.8	47.4	60.0	63.2
SBH 16	16	1.94	3.07	5.04	7.41	9.68	13.6	20.8	24.0	26.7	29.8	35.9	54.4	63.2	80.0	84.2
SBH 19	19	2.30	3.65	5.99	8.80	11.5	16.4	25.3	29.3	32.6	36.3	43.5	65.7	76.0	93.1	104
SBH 29	29	3.51	5.57	9.14	13.4	17.6	25.0	38.7	44.7	49.8	55.4	66.4	100	116	142	159
SBH 39	39	4.72	7.49	12.3	18.1	23.6	33.6	52.0	60.1	67.0	74.6	89.2	135	156	191	214
SBH 49	49	5.93	9.41	15.4	22.7	29.7	42.2	65.3	75.5	84.2	93.7	112	170	196	240	269
SBH 59	59	7.14	11.3	18.6	27.3	35.8	50.8	78.7	90.9	101	113	135	204	236	289	324
SBH 69	69	8.35	13.2	21.7	31.9	41.8	59.4	92.0	106	119	132	158	239	276	338	379
SBH 79	79	9.56	15.2	24.9	36.6	47.9	68.0	105	122	136	151	181	273	316	387	434
SBH 88	88	10.6	16.9	27.7	40.7	53.3	75.8	117	136	151	168	201	304	352	431	484
SBH 98	98	11.9	18.8	30.9	45.4	59.4	84.4	131	151	168	187	224	339	392	480	538
SBH 118	118	14.3	22.7	37.2	54.6	71.5	102	157	182	203	226	270	408	472	578	648
SBH 137	137	16.6	26.3	43.2	63.4	83.0	118	183	211	235	262	314	474	548	672	753
SBH 157	157	19.0	30.1	49.5	72.7	95.2	135	209	242	270	300	359	543	628	770	863
SBH 177	177	21.4	34.0	55.8	82.0	107	152	236	273	304	338	405	612	708	868	973
SBH 196	196	23.7	37.6	61.7	90.7	119	169	261	302	337	375	449	678	784	961	1077
SBH 236	236	28.6	45.3	74.3	109	143	203	315	364	405	451	540	817	944	1157	1297
SBH 265	265	32.1	50.9	83.5	123	161	228	353	408	455	507	606	917	1060	1299	1456
SBH 294	294	35.6	56.4	92.6	136	178	253	392	453	505	562	673	1017	1176	1441	1615
SBH 353	353	42.7	67.8	111	163	214	304	471	544	607	675	808	1221	1412	1730	1940
SBH 393	393	47.6	75.5	124	182	238	339	524	606	675	751	899	1360	1572	1926	2159
SBH 471	471	57.0	90.4	148	218	285	406	628	726	809	901	1078	1630	1884	2309	2588
SBH 491	491	59.4	94.3	155	227	298	423	655	757	844	939	1124	1699	1964	2407	2698
SBH 590	590	71.4	113	186	273	358	508	787	909	1014	1128	1350	2042	2360	2892	3242
SBH 640	640	77.4	123	202	296	387	551	842	953	1057	1169	1370	2024	2303	2741	2880
SBH 705	705	85.3	135	222	326	427	607	927	1050	1165	1287	1510	2230	2536	3019	3173
SBH 765	765	92.6	147	241	354	463	659	1006	1139	1264	1397	1638	2420	2752	3276	3443
SBH 865	865	105	166	272	400	523	745	1138	1288	1429	1580	1852	2736	3112	3704	3893
SBH 920	920	111	177	290	426	557	792	1210	1370	1520	1680	1970	2910	3310	3940	4140

Cell performance **H** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.03	1.64	2.69	3.97	5.21	7.55	13.4	16.1	17.7	20.0	23.9	35.5	41.7	50.9	55.0
SBH 12	12	1.49	2.36	3.89	5.74	7.54	10.9	19.3	23.3	25.6	28.9	34.5	51.3	60.3	73.6	79.5
SBH 16	16	1.98	3.15	5.18	7.65	10.1	14.6	25.8	31.0	34.1	38.6	46.0	68.4	80.4	98.2	106
SBH 19	19	2.36	3.74	6.16	9.10	11.9	17.3	31.0	38.1	41.8	47.3	56.0	83.3	95.0	117	126
SBH 29	29	3.60	5.71	9.40	13.9	18.2	26.4	47.3	58.1	63.7	72.1	85.5	127	145	179	192
SBH 39	39	4.84	7.68	12.6	18.7	24.5	35.5	63.6	78.2	85.7	97.0	115	171	195	241	258
SBH 49	49	6.08	9.65	15.9	23.5	30.8	44.6	79.9	98.2	108	122	145	215	245	302	325
SBH 59	59	7.32	11.6	19.1	28.3	37.1	53.7	96.2	118	130	147	174	259	295	364	391
SBH 69	69	8.56	13.6	22.4	33.1	43.4	62.8	113	138	152	172	204	303	345	426	457
SBH 79	79	9.80	15.6	25.6	37.8	49.7	71.9	129	158	174	197	233	346	395	488	523
SBH 88	88	10.9	17.3	28.5	42.2	55.3	80.1	144	176	193	219	260	386	440	543	583
SBH 98	98	12.2	19.3	31.8	46.9	61.6	89.2	160	196	215	244	289	430	490	605	649
SBH 118	118	14.6	23.2	38.2	56.5	74.2	107	192	236	259	294	348	518	590	728	781
SBH 137	137	17.0	27.0	44.4	65.6	86.2	125	223	275	301	341	404	601	685	846	907
SBH 157	157	19.5	30.9	50.9	75.2	98.7	143	256	315	345	391	463	689	785	969	1040
SBH 177	177	21.9	34.9	57.3	84.8	111	161	289	355	389	440	522	776	885	1093	1172
SBH 196	196	24.3	38.6	63.5	93.9	123	178	320	393	431	488	578	860	980	1210	1298
SBH 236	236	29.3	46.5	76.5	113	148	215	385	473	519	587	696	1035	1180	1457	1563
SBH 265	265	32.9	52.2	85.9	127	167	241	432	531	582	659	782	1162	1325	1636	1755
SBH 294	294	36.5	57.9	95.3	141	185	268	480	589	646	731	867	1289	1470	1815	1947
SBH 353	353	43.8	69.5	114	169	222	321	576	707	776	878	1041	1548	1765	2179	2338
SBH 393	393	48.7	77.4	127	188	247	358	641	788	864	978	1159	1724	1965	2426	2603
SBH 471	471	58.4	92.8	153	226	296	429	768	944	1035	1172	1389	2066	2355	2907	3119
SBH 491	491	60.9	96.7	159	235	309	447	801	984	1079	1221	1448	2154	2455	3031	3252
SBH 590	590	73.2	116	191	283	371	537	962	1182	1297	1468	1740	2588	2950	3642	3907
SBH 640	640	79.4	126	207	307	402	582	1037	1259	1363	1530	1781	2539	2866	3457	3603
SBH 705	705	87.4	139	228	338	443	642	1142	1387	1502	1686	1962	2797	3157	3809	3969
SBH 765	765	94.9	151	248	366	480	696	1239	1505	1630	1829	2129	3035	3426	4133	4307
SBH 865	865	107	170	280	414	543	787	1401	1702	1843	2068	2407	3432	3874	4673	4870
SBH 920	920	114	181	298	441	578	837	1490	1810	1960	2200	2560	3650	4120	4970	5180

Cell performance **H** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.04	1.66	2.73	4.05	5.33	7.80	14.1	18.8	21.2	24.1	29.1	43.0	48.5	61.5	65.4
SBH 12	12	1.50	2.40	3.95	5.86	7.70	11.3	20.4	27.2	30.7	34.9	42.1	62.2	70.2	88.9	94.5
SBH 16	16	2.00	3.20	5.26	7.81	10.3	15.0	27.2	36.3	40.9	46.5	56.1	82.9	93.6	119	126
SBH 19	19	2.38	3.80	6.25	9.27	12.2	17.9	32.7	44.1	50.1	57.1	68.8	97.9	112	141	154
SBH 29	29	3.63	5.80	9.54	14.2	18.6	27.3	49.9	67.3	76.5	87.1	105	149	171	215	236
SBH 39	39	4.88	7.80	12.8	19.0	25.1	36.7	67.1	90.5	103	117	141	201	229	289	317
SBH 49	49	6.13	9.80	16.1	23.9	31.5	46.1	84.3	114	129	147	178	253	288	363	398
SBH 59	59	7.38	11.8	19.4	28.8	37.9	55.5	102	137	156	177	214	304	347	437	480
SBH 69	69	8.63	13.8	22.7	33.7	44.4	64.8	119	160	182	207	250	356	406	511	561
SBH 79	79	9.88	15.8	26.0	38.6	50.8	74.2	136	183	208	237	286	407	465	585	642
SBH 88	88	11.0	17.6	29.0	42.9	56.6	82.7	151	204	232	264	319	454	518	652	715
SBH 98	98	12.3	19.6	32.2	47.8	63.0	92.1	169	227	259	294	355	505	576	726	797
SBH 118	118	14.8	23.6	38.8	57.6	75.9	111	203	274	311	354	428	608	694	874	959
SBH 137	137	17.1	27.4	45.1	66.9	88.1	129	236	318	361	411	496	706	806	1015	1114
SBH 157	157	19.6	31.4	51.7	76.6	101	148	270	364	414	471	569	809	924	1163	1276
SBH 177	177	22.1	35.4	58.2	86.4	114	166	305	411	467	532	641	912	1041	1311	1439
SBH 196	196	24.5	39.2	64.5	95.6	126	184	337	455	517	589	710	1010	1153	1452	1593
SBH 236	236	29.5	47.2	77.6	115	152	222	406	548	623	709	855	1216	1388	1748	1919
SBH 265	265	33.1	53.0	87.2	129	170	249	456	615	699	796	960	1366	1559	1963	2154
SBH 294	294	36.8	58.8	96.7	143	189	276	506	682	776	883	1065	1515	1729	2178	2390
SBH 353	353	44.1	70.6	116	172	227	332	608	819	931	1060	1279	1820	2076	2615	2870
SBH 393	393	49.1	78.6	129	192	253	369	676	912	1037	1180	1424	2026	2312	2911	3195
SBH 471	471	58.9	94.2	155	230	303	443	811	1093	1243	1414	1707	2428	2771	3489	3829
SBH 491	491	61.4	98.2	162	240	316	461	845	1139	1296	1474	1779	2531	2888	3637	3992
SBH 590	590	73.8	118	194	288	379	555	1015	1369	1557	1772	2138	3041	3471	4370	4797
SBH 640	640	80.0	128	211	312	411	602	1092	1468	1649	1857	2191	3026	3416	4153	4417
SBH 705	705	88.1	141	232	344	453	663	1203	1617	1816	2046	2414	3333	3763	4575	4866
SBH 765	765	95.6	153	252	373	491	719	1305	1755	1971	2220	2619	3617	4083	4964	5280
SBH 865	865	108	173	285	422	555	813	1476	1984	2228	2510	2962	4090	4616	5613	5970
SBH 920	920	115	184	303	449	591	865	1570	2110	2370	2670	3150	4350	4910	5970	6350

M Range

Cell performance **M** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.06	1.32	2.07	2.79	3.48	4.06	4.75	6.07	7.03	7.74	8.84	10.8	16.1	18.3	21.8	24.2
SBM 15	15	1.45	1.80	2.82	3.80	4.75	5.54	6.48	8.28	9.59	10.6	12.1	14.8	22.0	24.9	29.8	33.0
SBM 22	22	2.13	2.64	4.14	5.59	7.01	8.25	9.50	12.3	14.1	15.3	17.5	21.1	29.8	33.4	38.9	40.2
SBM 30	30	2.90	3.60	5.64	7.62	9.56	11.2	13.0	16.8	19.2	20.9	23.9	28.7	40.6	45.6	53.1	54.8
SBM 43	43	4.16	5.16	8.08	11.0	13.9	16.6	19.5	25.2	29.0	32.0	36.3	43.8	62.8	70.3	82.1	85.5
SBM 56	56	5.42	6.72	10.5	14.3	18.1	21.6	25.4	32.5	37.3	40.5	46.2	55.2	77.2	85.9	99.1	102
SBM 65	65	6.29	7.80	12.2	16.6	21.1	25.1	29.5	38.1	43.8	48.3	54.9	66.2	94.9	106	124	129
SBM 84	84	8.12	10.1	15.8	21.4	27.2	32.4	38.1	48.7	56.0	60.8	69.2	82.8	116	129	149	153
SBM 112	112	10.8	13.4	21.1	28.6	36.2	43.2	50.8	64.9	74.6	81.0	92.3	110	154	172	198	204
SBM 138	138	13.3	16.6	25.9	35.2	44.6	53.2	62.6	80.0	91.9	99.9	114	136	190	212	244	252
SBM 161	161	15.6	19.3	30.3	41.1	52.1	62.1	73.0	93.3	107	116	133	159	222	247	285	294
SBM 184	184	17.8	22.1	34.6	46.9	59.5	70.9	83.4	107	123	133	152	181	254	282	326	336
SBM 208	208	20.1	25.0	39.1	53.0	67.3	80.2	94.3	121	139	151	171	205	287	319	368	380
SBM 231	231	22.3	27.7	43.4	58.9	74.7	89.1	105	134	154	167	190	228	319	354	409	422
SBM 277	277	26.8	33.2	52.1	70.6	89.6	107	126	161	185	200	228	273	382	425	490	505
SBM 300	300	29.0	36.0	56.4	76.5	97.0	116	136	174	200	217	247	296	414	460	531	547
SBM 323	323	31.2	38.8	60.7	82.4	104	125	146	187	215	234	266	318	446	495	572	589
SBM 346	346	33.5	41.5	65.0	88.2	112	133	157	201	231	250	285	341	477	531	612	631
SBM 369	369	35.7	44.3	69.4	94.1	119	142	167	214	246	267	304	364	509	566	653	673
SBM 392	392	37.9	47.0	73.7	99.9	127	151	178	227	261	284	323	386	541	601	694	715
SBM 415	415	40.1	49.8	78.0	106	134	160	188	241	276	300	342	409	572	637	735	757
SBM 438	438	42.4	52.6	82.3	112	142	169	199	254	292	317	361	432	604	672	775	799
SBM 461	461	44.6	55.3	86.7	118	149	178	209	267	307	334	380	454	636	707	816	841
SBM 505	505	48.8	60.6	94.9	129	163	195	229	293	336	365	416	498	697	775	894	922
SBM 555	555	53.7	66.6	104	142	179	214	252	322	370	402	458	547	766	851	982	1013
SBM 625	625	60.4	75.0	118	159	202	241	283	362	416	452	515	616	862	959	1106	1141
SBM 690	690	66.7	82.8	130	176	223	266	313	400	460	499	569	680	952	1058	1221	1259
SBM 740	740	71.6	88.8	139	189	239	285	336	429	493	535	610	729	1021	1135	1310	1350
SBM 830	830	80.3	99.6	156	212	268	320	376	481	553	601	684	818	1145	1273	1469	1515
SBM 920	920	89.0	110	173	235	298	355	417	533	613	666	758	906	1269	1411	1628	1679
SBM 965	965	93.3	116	181	246	312	372	438	559	643	698	796	951	1331	1480	1708	1761
SBM 1040	1040	101	125	196	265	336	401	472	603	693	753	857	1025	1434	1595	1841	1898
SBM 1150	1150	111	138	216	293	372	443	522	667	766	832	948	1133	1586	1764	2035	2099
SBM 1220	1220	118	146	229	311	395	470	553	707	813	883	1006	1202	1683	1871	2159	2226
SBM 1390	1390	134	167	261	354	450	536	630	806	926	1006	1146	1369	1917	2132	2460	2536

Cell performance **M** range for stationary applications:

Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.09	1.35	2.15	3.19	4.08	4.82	5.84	7.57	8.75	9.58	10.9	13.4	19.7	22.6	27.6	29.3
SBM 15	15	1.49	1.85	2.93	4.35	5.56	6.58	7.97	10.3	11.9	13.1	14.9	18.3	26.9	30.8	37.7	39.9
SBM 22	22	2.18	2.71	4.29	6.38	8.19	9.72	11.9	15.3	17.7	19.2	21.5	26.1	37.0	41.4	49.2	52.4
SBM 30	30	2.97	3.69	5.85	8.71	11.2	13.3	16.2	20.9	24.1	26.1	29.4	35.6	50.5	56.5	67.1	71.4
SBM 43	43	4.26	5.29	8.39	12.5	16.1	19.4	24.2	31.5	36.7	39.9	44.9	54.4	76.9	87.0	103	119
SBM 56	56	5.55	6.89	10.9	16.3	21.0	25.3	31.5	40.6	47.0	50.8	57.3	68.4	95.4	106	126	133
SBM 65	65	6.44	8.00	12.7	18.9	24.4	29.3	36.5	47.6	55.5	60.4	67.8	82.2	116	132	156	180
SBM 84	84	8.32	10.3	16.4	24.5	31.5	37.9	47.2	60.9	70.5	76.2	85.9	103	143	160	188	200
SBM 112	112	11.1	13.8	21.8	32.6	42.1	50.5	63.0	81.2	94.0	102	115	137	191	213	251	267
SBM 138	138	13.7	17.0	26.9	40.2	51.8	62.3	77.6	100	116	125	141	168	235	262	309	329
SBM 161	161	16.0	19.8	31.4	46.9	60.5	72.7	90.5	117	135	146	165	197	274	306	361	383
SBM 184	184	18.2	22.6	35.9	53.6	69.1	83.0	103	133	154	167	188	225	313	350	413	438
SBM 208	208	20.6	25.6	40.6	60.6	78.1	93.9	117	151	175	189	213	254	354	395	466	495
SBM 231	231	22.9	28.4	45.0	67.2	86.7	104	130	168	194	210	236	282	394	439	518	550
SBM 277	277	27.4	34.1	54.0	80.6	104	125	156	201	233	251	283	338	472	527	621	660
SBM 300	300	29.7	36.9	58.5	87.3	113	135	169	218	252	272	307	366	511	570	673	714
SBM 323	323	32.0	39.7	63.0	94.0	121	146	182	234	271	293	330	394	550	614	724	769
SBM 346	346	34.3	42.6	67.5	101	130	156	194	251	291	314	354	422	589	658	776	824
SBM 369	369	36.6	45.4	72.0	107	139	167	207	268	310	335	377	451	629	702	827	879
SBM 392	392	38.8	48.2	76.4	114	147	177	220	284	329	356	401	479	668	745	879	933
SBM 415	415	41.1	51.0	80.9	121	156	187	233	301	348	377	424	507	707	789	930	988
SBM 438	438	43.4	53.9	85.4	128	164	198	246	318	368	397	448	535	746	833	982	1043
SBM 461	461	45.7	56.7	89.9	134	173	208	259	334	387	418	471	563	785	876	1034	1098
SBM 505	505	50.0	62.1	98.5	147	190	228	284	366	424	458	516	617	860	960	1132	1202
SBM 555	555	55.0	68.3	108	162	208	250	312	402	466	504	567	678	945	1055	1244	1321
SBM 625	625	61.9	76.9	122	182	235	282	351	453	525	567	639	763	1065	1188	1401	1488
SBM 690	690	68.4	84.9	135	201	259	311	388	500	579	626	706	842	1175	1312	1547	1643
SBM 740	740	73.3	91.0	144	215	278	334	416	537	621	672	757	904	1261	1407	1659	1762
SBM 830	830	82.2	102	162	242	312	375	467	602	697	753	849	1013	1414	1578	1861	1976
SBM 920	920	91.2	113	179	268	345	415	517	667	772	835	941	1123	1567	1749	2063	2190
SBM 965	965	95.6	119	188	281	362	435	542	700	810	876	987	1178	1644	1835	2164	2298
SBM 1040	1040	103	128	203	303	391	469	585	754	873	944	1063	1270	1772	1977	2332	2476
SBM 1150	1150	114	141	224	335	432	519	646	834	966	1044	1176	1404	1959	2186	2578	2738
SBM 1220	1220	121	150	238	355	458	551	686	885	1024	1107	1247	1490	2078	2319	2735	2905
SBM 1390	1390	138	171	271	405	522	627	781	1008	1167	1261	1421	1697	2368	2643	3117	3310

Cell performance **M** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.11	1.38	2.18	3.54	4.59	5.50	7.04	9.18	10.5	11.7	13.5	16.4	24.2	27.9	34.4	37.2
SBM 15	15	1.51	1.88	2.97	4.83	6.26	7.50	9.60	12.5	14.4	16.0	18.4	22.4	33.0	38.1	46.9	50.7
SBM 22	22	2.22	2.75	4.36	7.08	9.23	11.1	14.2	18.7	21.2	23.6	26.9	32.2	45.4	51.5	61.1	65.9
SBM 30	30	3.02	3.75	5.94	9.66	12.6	15.1	19.4	25.5	29.0	32.2	36.7	43.9	61.9	70.3	83.3	89.8
SBM 43	43	4.33	5.38	8.51	13.9	18.1	21.9	28.9	38.9	44.1	48.7	56.2	67.4	95.1	108	130	139
SBM 56	56	5.64	7.00	11.1	18.1	23.6	28.6	37.7	50.2	57.0	63.0	71.5	84.8	118	132	156	168
SBM 65	65	6.55	8.13	12.9	21.0	27.4	33.1	43.7	58.8	66.7	73.6	85.0	102	144	163	196	210
SBM 84	84	8.46	10.5	16.6	27.1	35.4	42.8	56.5	75.3	85.5	94.5	107	127	176	199	234	252
SBM 112	112	11.3	14.0	22.2	36.2	47.2	57.1	75.3	100	114	126	143	170	235	265	312	336
SBM 138	138	13.9	17.3	27.3	44.6	58.1	70.4	92.8	124	141	155	176	209	290	326	384	414
SBM 161	161	16.2	20.1	31.9	52.0	67.8	82.1	108	144	164	181	206	244	338	381	448	483
SBM 184	184	18.5	23.0	36.4	59.4	77.5	93.8	124	165	187	207	235	279	387	435	513	553
SBM 208	208	20.9	26.0	41.2	67.2	87.6	106	140	187	212	234	266	315	437	492	579	625
SBM 231	231	23.3	28.9	45.7	74.6	97.3	118	155	207	235	260	295	350	485	546	643	694
SBM 277	277	27.9	34.6	54.8	89.5	117	141	186	248	282	312	354	420	582	655	772	832
SBM 300	300	30.2	37.5	59.4	96.9	126	153	202	269	305	337	383	455	630	709	836	901
SBM 323	323	32.5	40.4	63.9	104	136	165	217	290	329	363	413	489	679	764	900	970
SBM 346	346	34.8	43.3	68.5	112	146	176	233	310	352	389	442	524	727	818	964	1039
SBM 369	369	37.2	46.1	73.1	119	155	188	248	331	376	415	471	559	775	872	1028	1108
SBM 392	392	39.5	49.0	77.6	127	165	200	264	352	399	441	501	594	824	927	1092	1177
SBM 415	415	41.8	51.9	82.2	134	175	212	279	372	423	467	530	629	872	981	1156	1246
SBM 438	438	44.1	54.8	86.7	141	184	223	295	393	446	493	559	664	920	1035	1220	1315
SBM 461	461	46.4	57.6	91.3	149	194	235	310	413	469	519	589	698	968	1090	1284	1384
SBM 505	505	50.9	63.1	100	163	213	258	340	453	514	568	645	765	1061	1194	1407	1517
SBM 555	555	55.9	69.4	110	179	234	283	373	498	565	624	709	841	1166	1312	1546	1667
SBM 625	625	62.9	78.1	124	202	263	319	420	561	636	703	798	947	1313	1478	1741	1877
SBM 690	690	69.5	86.3	137	223	291	352	464	619	703	776	881	1045	1450	1631	1922	2072
SBM 740	740	74.5	92.5	147	239	312	377	498	664	754	832	945	1121	1555	1749	2061	2222
SBM 830	830	83.6	104	164	268	350	423	558	744	845	934	1060	1258	1744	1962	2312	2492
SBM 920	920	92.6	115	182	297	388	469	619	825	937	1035	1175	1394	1933	2175	2563	2763
SBM 965	965	97.2	121	191	312	406	492	649	865	983	1085	1232	1462	2027	2281	2688	2898
SBM 1040	1040	105	130	206	336	438	530	699	933	1059	1170	1328	1576	2185	2459	2897	3123
SBM 1150	1150	116	144	228	371	484	586	773	1031	1171	1294	1469	1742	2416	2719	3203	3453
SBM 1220	1220	123	153	242	394	514	622	820	1094	1242	1372	1558	1848	2563	2884	3398	3664
SBM 1390	1390	140	174	275	449	586	709	935	1247	1415	1564	1775	2106	2920	3286	3872	4174

Cell performance **M** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.12	1.39	2.20	3.60	5.24	6.27	8.04	10.8	12.7	14.0	15.9	19.8	29.3	33.6	42.3	46.6
SBM 15	15	1.52	1.89	3.00	4.91	7.14	8.55	11.0	14.8	17.3	19.1	21.7	27.0	40.0	45.9	57.7	63.6
SBM 22	22	2.23	2.77	4.40	7.19	10.5	12.6	16.3	22.0	25.8	28.2	31.8	38.9	55.4	62.5	75.3	79.7
SBM 30	30	3.04	3.78	6.00	9.81	14.3	17.2	22.2	30.0	35.2	38.4	43.4	53.0	75.6	85.2	103	109
SBM 43	43	4.36	5.42	8.60	14.1	20.6	24.8	32.2	45.8	53.6	58.8	66.8	81.6	115	131	159	169
SBM 56	56	5.68	7.06	11.2	18.3	26.8	32.3	41.9	59.3	69.3	75.8	85.6	104	144	161	192	204
SBM 65	65	6.60	8.19	13.0	21.3	31.1	37.5	48.6	69.3	81.0	88.9	101	123	174	198	240	256
SBM 84	84	8.53	10.6	16.8	27.5	40.2	48.4	62.8	88.9	104	114	128	155	216	242	289	305
SBM 112	112	11.4	14.1	22.4	36.6	53.5	64.6	83.8	119	139	152	171	207	289	323	385	407
SBM 138	138	14.0	17.4	27.6	45.1	66.0	79.6	103	146	171	187	211	255	356	398	474	502
SBM 161	161	16.3	20.3	32.2	52.6	77.0	92.8	120	170	199	218	246	298	415	464	553	585
SBM 184	184	18.7	23.2	36.8	60.2	88.0	106	138	195	228	249	281	340	474	530	632	669
SBM 208	208	21.1	26.2	41.6	68.0	99.4	120	156	220	257	281	318	384	536	599	715	756
SBM 231	231	23.4	29.1	46.2	75.5	110	133	173	244	286	313	353	427	595	666	794	840
SBM 277	277	28.1	34.9	55.4	90.6	132	160	207	293	343	375	424	512	714	798	952	1007
SBM 300	300	30.4	37.8	60.0	98.1	143	173	224	317	371	406	459	555	773	865	1031	1091
SBM 323	323	32.8	40.7	64.6	106	154	186	242	342	400	437	494	597	832	931	1110	1175
SBM 346	346	35.1	43.6	69.2	113	165	200	259	366	428	468	529	640	892	997	1189	1258
SBM 369	369	37.5	46.5	73.8	121	176	213	276	390	457	499	564	682	951	1063	1268	1342
SBM 392	392	39.8	49.4	78.4	128	187	226	293	415	485	530	599	725	1010	1130	1347	1425
SBM 415	415	42.1	52.3	83.0	136	198	239	310	439	514	562	635	767	1070	1196	1426	1509
SBM 438	438	44.5	55.2	87.6	143	209	253	328	463	542	593	670	810	1129	1262	1505	1593
SBM 461	461	46.8	58.1	92.2	151	220	266	345	488	571	624	705	852	1188	1329	1584	1676
SBM 505	505	51.3	63.6	101	165	241	291	378	534	625	683	772	933	1302	1455	1735	1836
SBM 555	555	56.3	69.9	111	181	265	320	415	587	687	751	849	1026	1430	1599	1907	2018
SBM 625	625	63.4	78.7	125	204	299	360	467	661	774	846	956	1155	1611	1801	2148	2273
SBM 690	690	70.0	86.9	138	226	330	398	516	730	854	934	1055	1275	1778	1988	2371	2509
SBM 740	740	75.1	93.2	148	242	354	427	553	783	916	1001	1131	1368	1907	2133	2543	2691
SBM 830	830	84.2	105	166	271	397	479	621	878	1027	1123	1269	1534	2139	2392	2852	3018
SBM 920	920	93.4	116	184	301	440	531	688	974	1139	1245	1407	1701	2371	2651	3162	3345
SBM 965	965	97.9	122	193	316	461	557	722	1021	1194	1306	1476	1784	2487	2781	3316	3509
SBM 1040	1040	106	131	208	340	497	600	778	1101	1287	1407	1590	1922	2680	2997	3574	3782
SBM 1150	1150	117	145	230	376	550	663	860	1217	1423	1556	1758	2126	2964	3314	3952	4182
SBM 1220	1220	124	154	244	399	583	704	912	1291	1510	1651	1865	2255	3144	3516	4192	4436
SBM 1390	1390	141	175	278	455	664	802	1040	1471	1720	1881	2125	2569	3582	4006	4777	5055

L Range

Cell performance **L** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.74	0.86	1.15	1.69	2.10	2.37	2.66	3.26	3.67	3.92	4.31	4.97	6.76	7.21	8.45	8.71
SBL 16	16	1.53	1.79	2.42	3.61	3.94	4.57	5.21	6.05	6.47	6.69	6.95	7.77	9.48	10.4	12.4	14.0
SBL 30	30	2.87	3.36	4.54	6.78	7.39	8.57	9.76	11.4	12.1	12.5	13.0	14.6	17.8	19.5	23.3	26.2
SBL 37	37	3.62	4.24	5.67	8.36	10.5	11.9	13.4	16.1	18.1	19.3	21.0	24.1	31.5	33.9	36.5	40.8
SBL 45	45	4.31	5.04	6.81	10.2	11.1	12.9	14.6	17.0	18.2	18.8	19.5	21.9	26.7	29.2	35.0	39.3
SBL 48	48	4.70	5.50	7.34	10.8	13.5	15.2	17.4	20.6	23.2	24.4	26.6	30.6	39.7	43.0	46.2	46.8
SBL 59	59	5.65	6.61	8.93	13.3	14.5	16.9	19.2	22.3	23.9	24.7	25.6	28.7	35.0	38.3	45.9	51.5
SBL 70	70	6.85	8.02	10.7	15.8	19.9	22.5	25.3	30.5	34.2	36.6	39.7	45.5	59.6	64.2	69.1	77.2
SBL 90	90	8.81	10.3	13.8	20.3	25.3	28.6	32.6	38.5	43.5	45.8	49.9	57.4	74.4	80.7	86.5	87.7
SBL 102	102	9.99	11.7	15.6	23.0	29.0	32.8	36.9	44.4	49.9	53.3	57.9	66.3	86.9	93.6	101	112
SBL 131	131	12.8	15.0	20.0	29.6	36.8	41.6	47.4	56.1	63.3	66.7	72.6	83.5	108	117	126	128
SBL 173	173	16.9	19.8	26.5	39.1	48.6	54.9	62.6	74.1	83.6	88.1	95.9	110	143	155	166	169
SBL 214	214	20.9	24.5	32.7	48.3	60.1	67.9	77.5	91.6	103	109	119	136	177	192	206	209
SBL 256	256	25.1	29.3	39.1	57.8	72.0	81.3	92.7	110	124	130	142	163	212	230	246	250
SBL 304	304	29.8	34.8	46.5	68.6	85.4	96.5	110	130	147	155	169	194	251	273	292	296
SBL 346	346	33.9	39.6	52.9	78.1	97.2	110	125	148	167	176	192	221	286	310	333	337
SBL 387	387	37.9	44.3	59.2	87.4	109	123	140	166	187	197	215	247	320	347	372	377
SBL 429	429	42.0	49.1	65.6	96.8	121	136	155	184	207	218	238	273	355	385	413	418
SBL 470	470	46.0	53.8	71.9	106	132	149	170	201	227	239	261	300	388	422	452	458
SBL 510	510	49.9	58.4	78.0	115	143	162	185	218	246	260	283	325	421	457	490	497
SBL 600	600	58.7	68.7	91.7	135	169	190	217	257	290	305	333	382	496	538	577	585
SBL 645	645	63.1	73.9	98.6	146	181	205	233	276	312	328	358	411	533	578	620	629
SBL 770	770	75.4	88.2	118	174	216	244	279	330	372	392	427	491	636	691	740	750
SBL 860	860	84.2	98.5	131	194	242	273	311	368	415	438	477	548	711	771	827	838
SBL 1020	1020	99.8	117	156	230	287	324	369	437	493	519	565	650	843	915	981	994
SBL 1070	1070	105	123	164	242	301	340	387	458	517	545	593	682	884	960	1029	1043
SBL 1280	1280	125	147	196	289	360	406	463	548	618	652	710	816	1058	1148	1231	1248
SBL 1450	1450	142	166	222	327	408	460	525	621	700	738	804	924	1198	1300	1394	1413
SBL 1540	1540	151	176	235	348	433	489	557	660	744	784	854	982	1273	1381	1481	1501

Cell performance **L** range for stationary applications:

Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.75	0.90	1.31	1.92	2.53	2.89	3.31	4.05	4.60	4.92	5.38	6.25	8.33	9.10	10.1	10.4
SBL 16	16	1.59	1.90	2.80	4.07	5.38	6.36	7.36	8.30	8.98	9.22	9.63	10.3	12.4	13.5	16.0	18.0
SBL 30	30	2.98	3.57	5.24	7.62	10.1	11.9	13.8	15.6	16.8	17.3	18.1	19.3	23.3	25.3	30.0	33.7
SBL 37	37	3.71	4.43	6.46	9.46	12.6	14.7	16.9	20.3	23.0	24.2	26.3	30.6	38.9	42.1	47.0	50.8
SBL 45	45	4.48	5.35	7.86	11.4	15.1	17.9	20.7	23.4	25.3	25.9	27.1	29.0	35.0	37.9	45.0	50.6
SBL 48	48	4.83	5.77	8.38	12.3	16.3	18.8	21.5	25.9	29.1	30.7	33.4	39.0	49.7	53.4	57.8	58.5
SBL 59	59	5.87	7.01	10.3	15.0	19.8	23.5	27.1	30.6	33.1	34.0	35.5	38.0	45.8	49.7	59.1	66.4
SBL 70	70	7.02	8.39	12.2	17.9	23.9	27.8	31.9	38.3	43.4	45.9	49.7	57.8	73.5	79.7	88.8	96.0
SBL 90	90	9.05	10.8	15.7	23.0	30.5	35.2	40.3	48.5	54.5	57.7	62.6	73.1	93.3	100	108	110
SBL 102	102	10.2	12.2	17.8	26.1	34.8	40.5	46.5	55.9	63.3	66.8	72.4	84.2	107	116	129	140
SBL 131	131	13.2	15.7	22.9	33.5	44.4	51.3	58.7	70.7	79.3	83.9	91.1	106	136	146	158	160
SBL 173	173	17.4	20.8	30.2	44.2	58.6	67.7	77.5	93.3	105	111	120	140	179	192	208	211
SBL 214	214	21.5	25.7	37.3	54.7	72.5	83.8	95.9	115	130	137	149	174	222	238	258	261
SBL 256	256	25.7	30.8	44.7	65.4	86.8	100	115	138	155	164	178	208	265	285	308	312
SBL 304	304	30.6	36.5	53.1	77.7	103	119	136	164	184	195	211	247	315	338	366	370
SBL 346	346	34.8	41.6	60.4	88.4	117	135	155	187	209	222	241	281	359	385	416	421
SBL 387	387	38.9	46.5	67.5	98.9	131	151	173	209	234	248	269	314	401	430	466	471
SBL 429	429	43.1	51.6	74.9	110	145	168	192	231	260	275	298	348	445	477	516	523
SBL 470	470	47.3	56.5	82.0	120	159	184	211	254	285	301	327	381	487	523	566	572
SBL 510	510	51.3	61.3	89.0	130	173	200	229	275	309	327	355	414	528	567	614	621
SBL 600	600	60.3	72.1	105	153	203	235	269	324	363	384	417	487	622	667	722	731
SBL 645	645	64.9	77.5	113	165	219	252	289	348	390	413	449	524	668	717	776	786
SBL 770	770	77.4	92.5	134	197	261	301	345	415	466	493	535	625	798	857	927	938
SBL 860	860	86.5	103	150	220	292	337	385	464	521	551	598	698	891	957	1035	1048
SBL 1020	1020	103	123	178	261	346	399	457	550	617	653	709	828	1057	1135	1227	1242
SBL 1070	1070	108	129	187	273	363	419	480	577	648	685	744	869	1109	1190	1288	1303
SBL 1280	1280	129	154	223	327	434	501	574	690	775	820	890	1039	1326	1424	1540	1559
SBL 1450	1450	146	174	253	370	492	568	650	782	878	929	1008	1177	1503	1613	1745	1766
SBL 1540	1540	155	185	269	393	522	603	690	831	932	987	1071	1250	1596	1713	1853	1876

Cell performance **L** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.77	0.95	1.49	2.17	2.89	3.48	4.07	5.03	5.61	6.04	6.73	7.88	10.3	11.1	12.8	13.3
SBL 16	16	1.62	2.00	3.17	4.54	5.99	7.13	8.54	10.4	11.1	11.5	12.1	13.3	16.1	17.4	20.6	23.8
SBL 30	30	3.04	3.75	5.94	8.51	11.2	13.4	16.0	19.6	20.9	21.5	22.7	24.9	30.2	32.5	38.6	44.6
SBL 37	37	3.78	4.66	7.33	10.7	14.4	17.5	20.7	25.4	28.2	30.4	33.5	38.3	48.5	52.6	57.2	63.4
SBL 45	45	4.57	5.63	8.91	12.8	16.8	20.1	24.0	29.4	31.3	32.2	34.0	37.3	45.4	48.8	57.9	67.0
SBL 48	48	4.91	6.05	9.50	13.9	18.6	22.5	26.4	32.2	35.8	38.3	42.7	48.6	61.1	66.0	73.8	78.4
SBL 59	59	5.99	7.38	11.7	16.7	22.1	26.3	31.5	38.5	41.0	42.2	44.6	48.9	59.5	64.0	75.9	87.8
SBL 70	70	7.16	8.82	13.9	20.3	27.2	33.0	39.1	48.1	53.4	57.5	63.3	72.5	91.7	99.4	108	120
SBL 90	90	9.20	11.3	17.8	26.0	34.8	42.2	49.6	60.4	67.2	71.8	80.1	91.2	115	124	138	147
SBL 102	102	10.4	12.8	20.2	29.6	39.6	48.1	57.0	70.1	77.7	83.7	92.2	106	134	145	158	175
SBL 131	131	13.4	16.5	25.9	37.9	50.7	61.4	72.1	87.9	97.8	104	117	133	167	180	202	214
SBL 173	173	17.7	21.8	34.2	50.0	67.0	81.1	95.3	116	129	138	154	175	220	238	266	283
SBL 214	214	21.9	27.0	42.4	61.8	82.8	100	118	144	160	171	190	217	272	294	329	350
SBL 256	256	26.2	32.2	50.7	74.0	99.1	120	141	172	191	204	228	259	326	352	394	418
SBL 304	304	31.1	38.3	60.2	87.9	118	142	167	204	227	242	270	308	387	418	468	497
SBL 346	346	35.4	43.6	68.5	100	134	162	191	232	258	276	308	351	440	476	532	565
SBL 387	387	39.6	48.7	76.6	112	150	181	213	260	289	309	344	392	492	532	595	632
SBL 429	429	43.9	54.0	84.9	124	166	201	236	288	320	342	382	435	546	590	660	701
SBL 470	470	48.1	59.2	93.0	136	182	220	259	315	351	375	418	476	598	646	723	768
SBL 510	510	52.1	64.2	101	147	197	239	281	342	381	407	454	517	649	702	785	833
SBL 600	600	61.3	75.6	119	173	232	281	330	403	448	478	534	608	763	825	923	980
SBL 645	645	66.0	81.2	128	186	250	302	355	433	482	514	574	653	821	887	992	1054
SBL 770	770	78.7	97.0	152	223	298	361	424	517	575	614	685	780	980	1059	1185	1258
SBL 860	860	87.9	108	170	249	333	403	474	577	642	686	765	871	1094	1183	1323	1405
SBL 1020	1020	104	128	202	295	395	478	562	685	762	813	907	1033	1298	1403	1569	1667
SBL 1070	1070	109	135	212	309	414	501	589	718	799	853	952	1084	1361	1472	1646	1748
SBL 1280	1280	131	161	253	370	495	600	705	859	956	1021	1139	1297	1628	1761	1969	2092
SBL 1450	1450	148	183	287	419	561	679	798	973	1083	1156	1290	1469	1845	1994	2231	2369
SBL 1540	1540	157	194	305	445	596	722	848	1034	1150	1228	1370	1560	1959	2118	2369	2516

Cell performance **L** range for stationary applications:
Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.77	0.95	1.50	2.42	3.30	3.94	4.89	6.04	6.82	7.29	8.10	9.54	12.4	13.7	15.5	15.9
SBL 16	16	1.64	2.02	3.20	5.09	6.84	8.05	9.74	12.2	13.4	14.0	14.9	16.8	20.3	21.7	25.6	28.8
SBL 30	30	3.07	3.79	6.00	9.55	12.8	15.1	18.3	22.9	25.1	26.2	28.0	31.5	38.1	40.7	48.0	54.0
SBL 37	37	3.81	4.70	7.40	12.0	16.3	19.6	24.8	30.4	34.3	36.6	40.3	46.5	59.0	64.0	71.6	77.4
SBL 45	45	4.61	5.68	9.00	14.3	19.2	22.6	27.4	34.4	37.7	39.3	42.0	47.3	57.2	61.0	72.0	80.9
SBL 48	48	4.95	6.10	9.60	15.5	21.2	25.3	31.3	38.6	43.7	46.6	51.1	58.8	74.7	80.8	91.1	94.1
SBL 59	59	6.05	7.45	11.8	18.8	25.2	29.7	35.9	45.0	49.4	51.6	55.1	62.0	75.0	79.9	94.4	106
SBL 70	70	7.22	8.89	14.0	22.7	30.9	37.0	46.9	57.5	64.9	69.2	76.2	87.9	112	121	135	146
SBL 90	90	9.28	11.4	18.0	29.1	39.7	47.5	58.7	72.5	81.9	87.5	95.7	110	140	152	171	176
SBL 102	102	10.5	13.0	20.4	33.1	45.1	54.0	68.3	83.8	94.5	101	111	128	163	176	197	213
SBL 131	131	13.5	16.6	26.2	42.3	57.7	69.1	85.5	105	119	127	139	160	204	221	249	257
SBL 173	173	17.8	22.0	34.6	55.9	76.2	91.2	113	139	157	168	184	212	269	291	328	339
SBL 214	214	22.1	27.2	42.8	69.1	94.3	113	140	172	195	208	228	262	333	360	406	420
SBL 256	256	26.4	32.5	51.2	82.7	113	135	167	206	233	249	272	313	398	431	486	502
SBL 304	304	31.3	38.6	60.8	98.2	134	160	198	245	277	295	323	372	473	512	577	596
SBL 346	346	35.7	43.9	69.2	112	152	182	226	279	315	336	368	424	538	582	657	678
SBL 387	387	39.9	49.1	77.4	125	171	204	252	312	352	376	412	474	602	652	734	759
SBL 429	429	44.2	54.5	85.8	139	189	226	280	345	390	417	456	525	667	722	814	841
SBL 470	470	48.5	59.7	94.0	152	207	248	307	378	428	457	500	575	731	791	892	922
SBL 510	510	52.6	64.8	102	165	225	269	333	411	464	496	543	624	793	859	968	1000
SBL 600	600	61.9	76.2	120	194	264	316	391	483	546	583	638	734	933	1010	1139	1176
SBL 645	645	66.5	81.9	129	208	284	340	421	519	587	627	686	789	1003	1086	1224	1265
SBL 770	770	79.4	97.8	154	249	339	406	502	620	701	748	819	942	1198	1296	1461	1510
SBL 860	860	88.7	109	172	278	379	454	561	692	783	836	915	1053	1337	1448	1632	1686
SBL 1020	1020	105	130	204	329	450	538	665	821	928	991	1085	1248	1586	1717	1935	2000
SBL 1070	1070	110	136	214	346	472	564	698	862	974	1040	1138	1310	1664	1801	2030	2098
SBL 1280	1280	132	163	256	413	564	675	835	1031	1165	1244	1362	1567	1991	2155	2429	2510
SBL 1450	1450	149	184	290	468	639	765	946	1167	1319	1409	1543	1775	2255	2441	2751	2843
SBL 1540	1540	159	196	308	497	679	812	1005	1240	1401	1497	1638	1885	2395	2593	2922	3020

Charge and discharge characteristics

Charging

The battery can be charged by all normal methods. Generally, batteries in parallel operation with charger and load are charged with constant voltage.
In operations where the battery is charged separated from the load, charging with constant current or declining current is recommended. High-rate or overcharge will not damage the battery, but excessive charging will increase water consumption to some degree.

Initial charging

First charge of batteries delivered discharged: the whole charge should preferably be carried out at constant current. When the charger maximum voltage setting is too low to supply constant current charging, divide the battery into two parts to be charged individually.
The charging time is inversely proportional to the current which is set by the current limit of the charging equipment. See installation and maintenance instructions for recommended rates for the first charging.

Constant voltage charging (+20°C to +25°C or +68°F to +77°F)

- *Continuous parallel operation,* with occasional battery discharge. Recommended charging voltage:
  - For two level charge:
    - Float level:
      1.42 ± 0.01 V/cell for SBL
      1.40 ± 0.01 V/cell for SBM and SBH
    - High level:
      1.47 - 1.70 V/cell for SBL
      1.45 - 1.70 V/cell for SBM and SBH
      A high voltage will increase the speed and efficiency of the recharging.
  - For single level charge:
    1.43 - 1.50 V/cell.
- *Buffer operation,* where the load exceeds the charger rating. Recommended charging voltage:
  1.50 - 1.60 V/cell.

Constant current charging

- Normal charging: 0.2 C_5A for 10 h.

Discharge performance

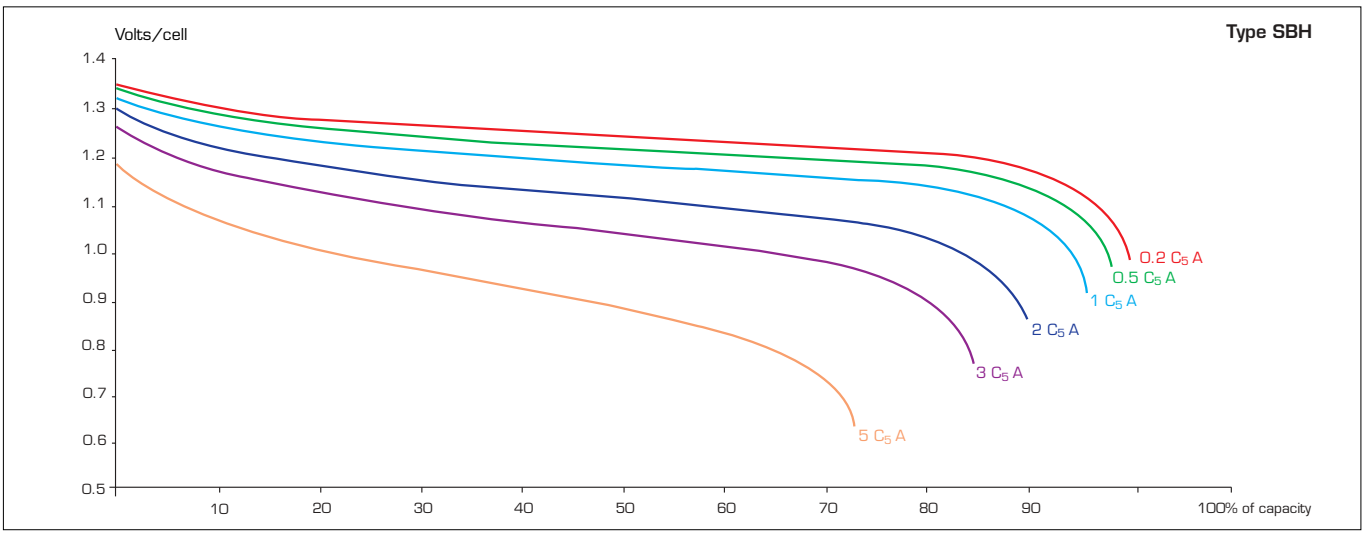
- *Nominal voltage:* 1.2 V/cell.
- *Discharge performance:* see tabulated data pages 13 to 24, 27, 28, and 35 to 46.
- *Typical discharge performance diagrams:* see page 26.
  The tabulated discharge performance data and the rated capacities C_5 are valid for cells fully charged in accordance with IEC, publication 60623, clause 4.
- *Rated (nominal) capacity:* for all cell types the rated capacity C_5 is defined as available ampere-hours (Ah) at 5 hours discharge to an end voltage of 1.0 V/cell.

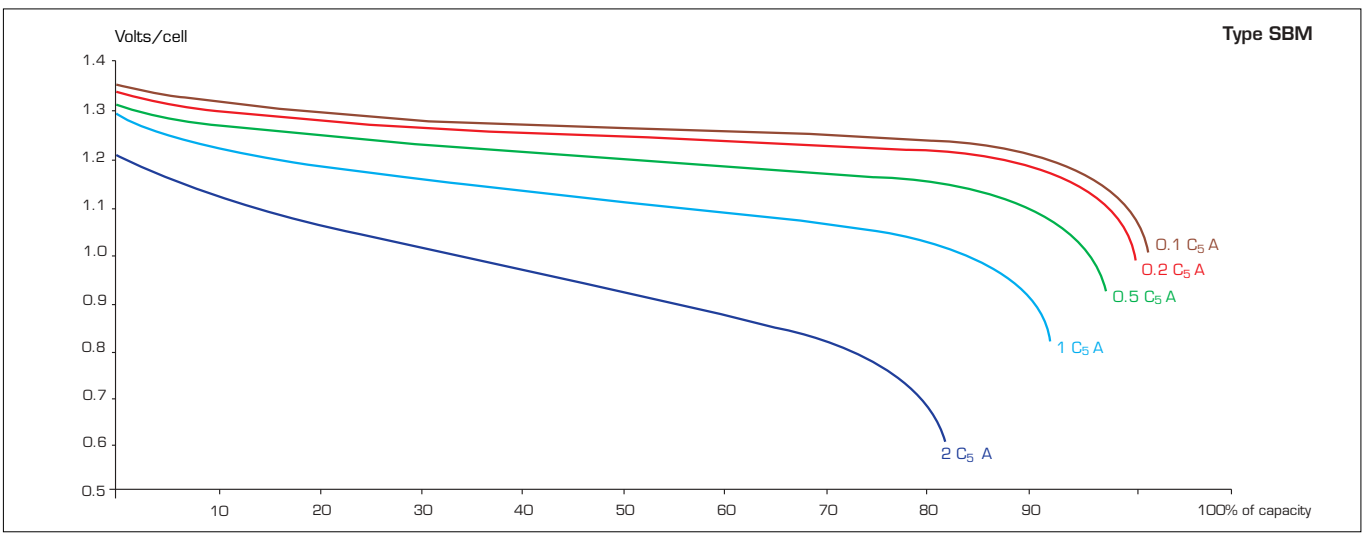
Important:

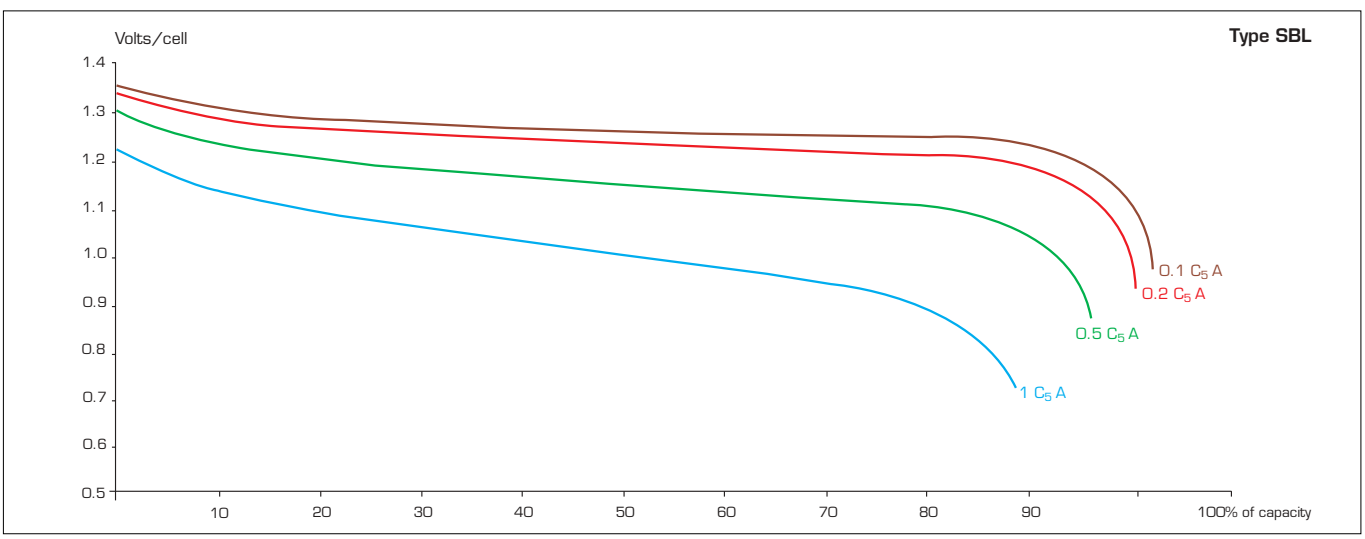
the rated capacity C_5 is no measure of performance. The performance depends on the battery construction. For example, a high-rate cell at 15 minutes discharge can deliver about twice the discharge current compared to a capacity cell of equal rated capacity.

Therefore always use the discharge performance tables to find the proper alternative for a specific application. The final choice of cell type should be done by comparison of prices, dimensions, etc.

Typical discharge characteristics at +20°C (+68°F)
These illustrative curves should not be used for precise calculation







H Range

Cell performance **H** range for engine starting applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes for fully charged cells at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 0.65 V/cell

Cell type	C_5 Ah	Minutes		Seconds			
		1.5	1	30	15	5	1
SBH 8.3	8.3	79.0	88.6	102	119	132	149
SBH 12	12	114	128	147	172	192	216
SBH 16	16	152	171	197	229	255	288
SBH 19	19	186	208	238	275	307	342
SBH 29	29	284	318	364	420	468	522
SBH 39	39	383	427	489	565	630	702
SBH 49	49	481	537	615	710	791	882
SBH 59	59	579	647	740	855	953	1060
SBH 69	69	677	756	866	1000	1110	1240
SBH 79	79	775	866	991	1140	1280	1420
SBH 88	88	863	964	1100	1260	1420	1580
SBH 98	98	961	1070	1230	1420	1580	1760
SBH 118	118	1160	1290	1480	1710	1910	2120
SBH 137	137	1340	1500	1720	1990	2210	2470
SBH 157	157	1540	1720	1970	2270	2540	2830
SBH 177	177	1740	1940	2220	2560	2860	3190
SBH 196	196	1920	2150	2460	2840	3170	3530
SBH 236	236	2320	2590	2960	3420	3810	4250
SBH 265	265	2600	2900	3330	3840	4280	4770
SBH 294	294	2880	3220	3690	4260	4750	5290
SBH 353	353	3460	3870	4430	5110	5700	6350
SBH 393	393	3860	4310	4930	5690	6350	7070
SBH 471	471	4620	5160	5910	6820	7610	8480
SBH 491	491	4820	5380	6160	7110	7930	8840
SBH 590	590	5790	6470	7400	8550	9530	10600
SBH 640	640	5960	6590	7400	8470	9270	10000
SBH 705	705	6560	7260	8160	9330	10200	11100
SBH 765	765	7120	7880	8850	10100	11100	12000
SBH 865	865	8050	8910	10000	11400	12500	13600
SBH 920	920	8560	9480	10600	12200	13300	14400

Cell performance **H** range for engine starting applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes for fully charged cells at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 0.85 V/cell

Cell type	C_5 Ah	Minutes		Seconds			
		1.5	1	30	15	5	1
SBH 8.3	8.3	61.3	68.2	77.6	91.1	101	111
SBH 12	12	88.7	98.6	112	132	146	161
SBH 16	16	118	132	150	176	195	214
SBH 19	19	144	159	181	210	234	255
SBH 29	29	220	243	277	321	357	389
SBH 39	39	296	327	372	431	480	523
SBH 49	49	371	411	468	542	603	658
SBH 59	59	447	495	563	653	726	792
SBH 69	69	523	579	659	763	849	926
SBH 79	79	599	663	754	874	972	1060
SBH 88	88	667	738	840	973	1080	1180
SBH 98	98	743	822	936	1080	1210	1320
SBH 118	118	894	990	1130	1310	1450	1580
SBH 137	137	1040	1150	1310	1520	1690	1840
SBH 157	157	1190	1320	1500	1740	1930	2110
SBH 177	177	1340	1490	1690	1960	2180	2380
SBH 196	196	1490	1640	1870	2170	2410	2630
SBH 236	236	1790	1980	2250	2610	2900	3170
SBH 265	265	2010	2220	2530	2930	3260	3560
SBH 294	294	2230	2470	2810	3250	3620	3960
SBH 353	353	2680	2960	3370	3900	4340	4740
SBH 393	393	2980	3300	3750	4350	4830	5270
SBH 471	471	3570	3950	4500	5210	5790	6320
SBH 491	491	3720	4120	4690	5430	6040	6590
SBH 590	590	4470	4950	5630	6630	7260	7920
SBH 640	640	4540	4970	5550	6300	6840	7440
SBH 705	705	5000	5470	6110	6940	7540	8190
SBH 765	765	5420	5940	6630	7530	8180	8890
SBH 865	865	6130	6710	7500	8510	9250	10100
SBH 920	920	6520	7140	7980	9050	9830	10700

Battery layout

Standard layouts

Saft has developed a series of standard layouts by which a battery may be ordered. Whether the battery is being installed on a rack, in a cabinet or is simply free-standing, the same configuration principals can be applied.

There are two ways to configure the battery.

- The first one, called "normal connection" is shown in figure 1. The cell's length is used to calculate the row length.
- The second method is shown in figure 2. The cell is turned through 90° and then connected width-to-width. This is referred to as "crosswise" mounted and its purpose is to minimize the installation's over-all length. The cell's width is used to calculate the row length.

Figure 1. Normal connection

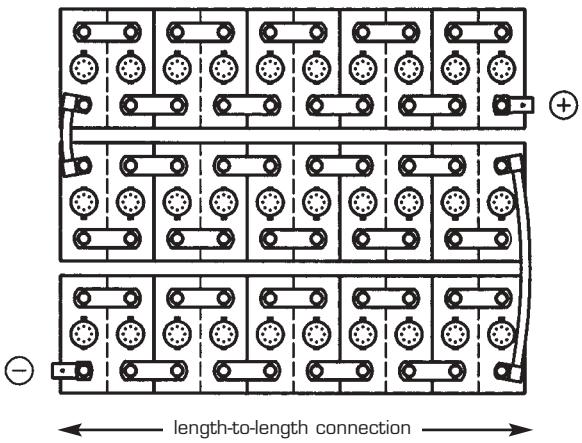


Figure 2. Crosswise connection

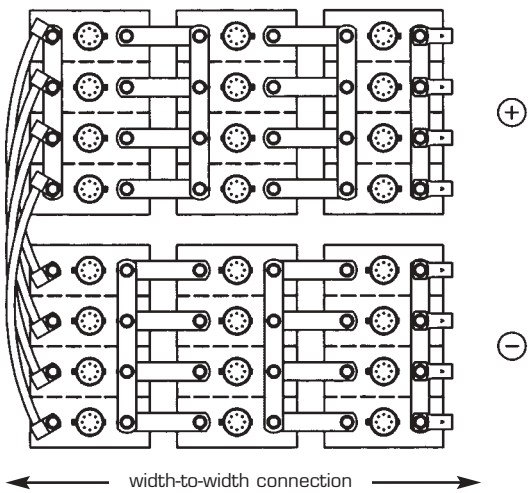


Table 1 demonstrates the connection method for Saft's extended range of batteries. All other designations utilize the normal method of connection (length-to-length).

Connection Type	SBH	SBM	SBL
Normal	8.3 to 157	11 to 392	7.5 to 470
Crosswise	177 to 920	415 to 1390	510 to 1540

Assembly method

Whatever your installation, use these simple guidlines when calculating your preferred configuration.

1. From the data in this publication, define the total number of cells in the battery.
2. Divide the length of the available installation area by the cell length (normal mount) or width (crosswise mount). This gives the maximum number of cells per row.
3. Divide the width (depth) of the available area by the cell width (normal mount) or length (crosswide mount). This will give the maximum number of rows.

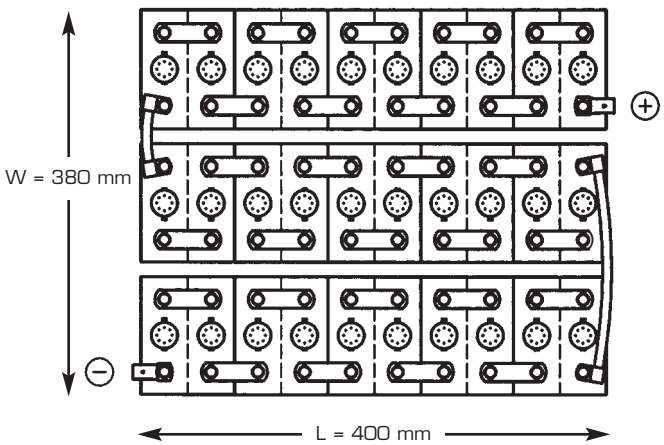
For example
If we consider a cabinet with three shelves: each shelf has a length of 400 mm and a width 380 mm. The battery comprises of 90 cells type SBM 15 (figure 3):

- The SBM 15-2 (two cell blocks) has a length of 74 mm and a width of 123 mm.
- Each shelf can have in its length 400/74 = 5 of the 15-2 two cell blocks.
- Each shelf can have in its width 380/123 = 3 rows of cell blocks.
- Thus each shelf can have 5 x 3 = 15 two cell blocks = 30 cells.

Whilst this is an ideal example, the calculation formula can be applied to all rack, cabinet and free-standing installations.
For engineering assistance on complex layouts, please contact the company or its agent.

When ordering a battery rack, please specify the battery type and the preferred rack configuration (see pages 31-32). If your battery is being assembled in a cabinet, or is free-standing, please specify the number of rows, cells per row and total number of cells. This will ensure that all necessary inter-row and inter-tier flexible connectors are provided.

Figure 3



Battery racks

Saft's product portfolio includes standard and anti-Seismic battery racks (conforming to Uniform Building Code, Seismic Zone 4). These have been designed for all cell types in the Saft range and are supplied unassembled to allow for easy installation. The purpose-built racks are strong, adaptable and provide good alkali protection.

Dimensions are given below for the range of rack layouts. Rack lengths are available in increments of 150 mm from 600 mm to a maximum of 6,000 mm. Calculate the required length using the cell length on page 5, 6 or 7 for normal connection, and by using the cell width 195 mm for crosswise connection.

Dimensions (mm) for single tier, standard floor mounted racks, normal connection

Cell type			1 tier rack					
			Depth (D) No. of steps			Height (H) No. of steps		
SBH	SBM	SBL	2	3	4	2	3	4
-	11, 15	7.5	430	645	860	480	580	680
8.3 to 16	22, 30	16, 30, 45, 59	430	645	860	550	650	750
19 to 157	43, 65	37, 70, 102	430	645	860	635	735	835
-	56, 84 to 392	48, 90, 131 to 470	430	645	860	690	790	890

Dimensions (mm) for double tier, standard floor mounted racks, normal connection

Cell type			2 tier rack					
			Depth (D) No. of steps			Height (H) No. of steps		
SBH	SBM	SBL	2	3	4	2	3	4
-	11, 15	7.5	500	715	930	1485	1585	1685
8.3 to 16	22, 30	16, 30, 45, 59	500	715	930	1555	1655	1755
19 to 157	43, 65	37, 70, 102	500	715	930	1640	1740	1840
-	56, 84 to 392	48, 90, 131 to 470	500	715	930	1695	1795	1895

Dimensions (mm) for single tier, standard floor mounted racks, crosswise connection

Cell type			1 tier rack							
			Depth (D) No. of steps				Height (H) No. of steps			
SBH	SBM	SBL	1	2	3	4	1	2	3	4
177 to 236	-	-	-	430	645	860	-	635	735	835
265 to 353	-	-	-	580	870	-	-	635	735	-
-	415 to 461	510	-	430	645	860	-	690	790	890
-	505 to 690	600 to 770	-	580	870	-	-	690	790	-
393 to 491	-	-	-	860	-	-	-	635	-	-
590	-	-	580	1160	-	-	535	635	-	-
640	740 to 965	860 to 1070	-	860	-	-	-	690	-	-
705 to 920	1040 to 1390	1280 to 1540	580	1160	-	-	590	690	-	-

Dimensions (mm) for double tier, standard floor mounted racks, crosswise connection

Cell type			2 tier rack							
			Depth (D) No. of steps				Height (H) No. of steps			
SBH	SBM	SBL	1	2	3	4	1	2	3	4
177 to 236	-	-	-	500	715	930	-	1640	1740	1840
265 to 353	-	-	-	650	940	-	-	1640	1740	-
-	415 to 461	510	-	500	715	930	-	1695	1795	1895
-	505 to 690	600 to 770	-	650	940	-	-	1695	1795	-
393 to 491	-	-	-	930	-	-	-	1640	-	-
590	-	-	650	1230	-	-	1540	1640	-	-
640	740 to 965	860 to 1070	-	930	-	-	-	1695	-	-
705 to 920	1040 to 1390	1280 to 1540	650	1230	-	-	1595	1695	-	-

Designations for single and double tier, standard floor mounted racks, normal connection

Cell type			1 tier No. of steps			2 tier No. of steps		
SBH	SBM	SBL	2	3	4	2	3	4
-	11, 15	7.5	SGL 2	SGL 3	SGL 4	ESGL 2	ESGL 3	ESGL 4
8.3 to 16	22, 30	16, 30, 45, 59	SGL 2	SGL 3	SGL 4	ESGL 2	ESGL 3	ESGL 4
19 to 157	43, 65	37, 70, 102	SGL 2	SGL 3	SGL 4	ESGL 2	ESGL 3	ESGL 4
-	56, 84 to 392	48, 90, 131 to 470	SGL 2	SGL 3	SGL 4	ESGL 2	ESGL 3	ESGL 4

Designations for single and double tier, standard floor mounted racks, crosswise connection

Cell type			1 tier No. of steps				2 tier No. of steps			
SBH	SBM	SBL	1	2	3	4	1	2	3	4
177 to 236	-	-	-	SGL 2	SGL 3	SGL 4	-	ESGL 2	ESGL 3	ESGL 4
265 to 353	-	-	-	SGS 2	SGS 3	-	-	ESGS 2	ESGS 3	-
-	415 to 461	510	-	SGL 2	SGL 3	SGL 4	-	ESGL 2	ESGL 3	ESGL 4
-	505 to 690	600 to 770	-	SGS 2	SGS 3	-	-	ESGS 2	ESGS 3	-
393 to 491	-	-	-	SGT 2	-	-	-	ESGT 2	-	-
590	-	-	PGS 2	SGU 2	-	-	EPGS 2	ESGU 2	-	-
640	740 to 965	860 to 1070	-	SGT 2	-	-	-	ESGT 2	-	-
705 to 920	1040 to 1390	1280 to 1540	PGS 2	SGU 2	-	-	EPGS 2	ESGU 2	-	-

Battery racks

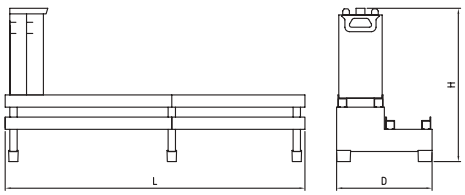


Diagram 1
1 tier, 2 steps, normal connection

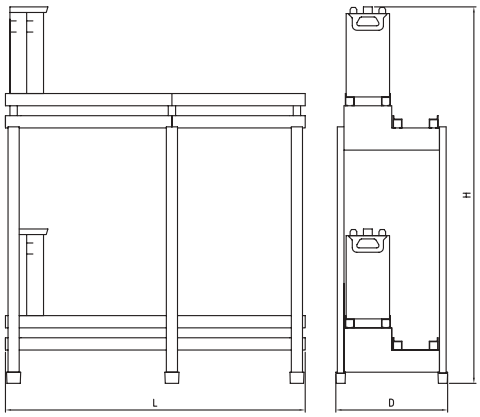


Diagram 2
2 tier, 2 steps, normal connection

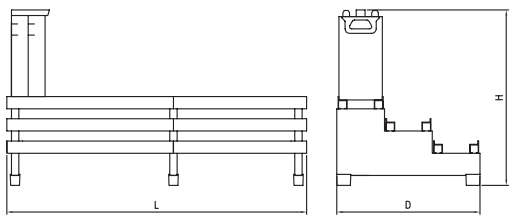


Diagram 3
1 tier, 3 steps, normal connection

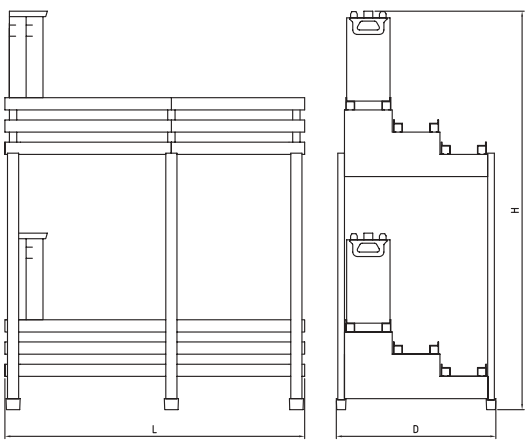


Diagram 4
2 tier, 3 steps, normal connection

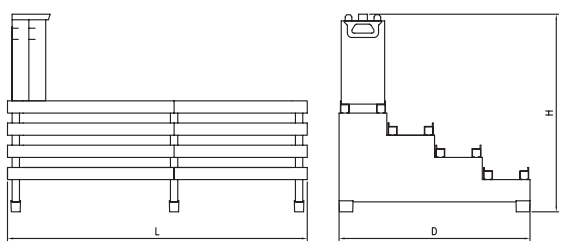


Diagram 5
1 tier, 4 steps, normal connection

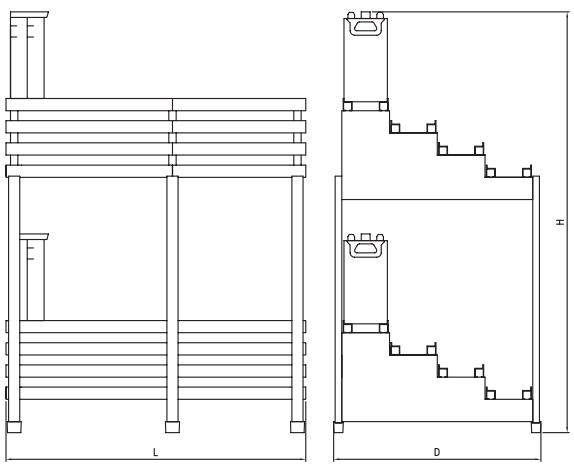


Diagram 6
2 tier, 4 steps, normal connection

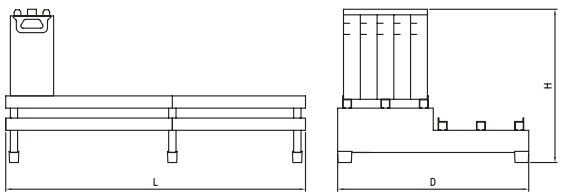


Diagram 7
1 tier, 2 steps, crosswise connection

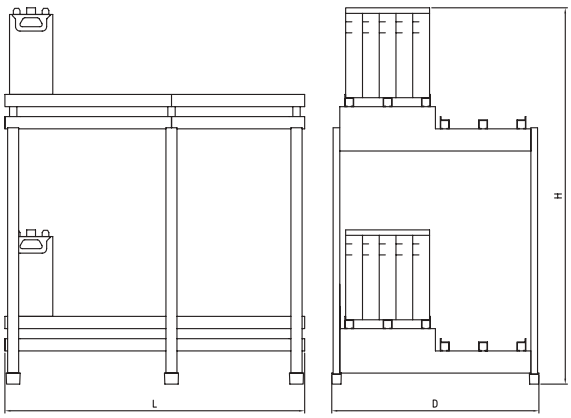


Diagram 8
2 tier, 2 steps, crosswise connection

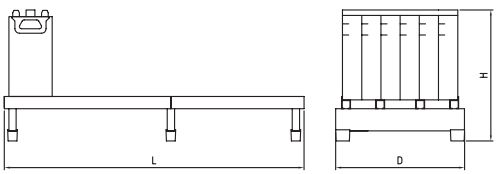


Diagram 9
1 tier, 1 step, crosswise connection

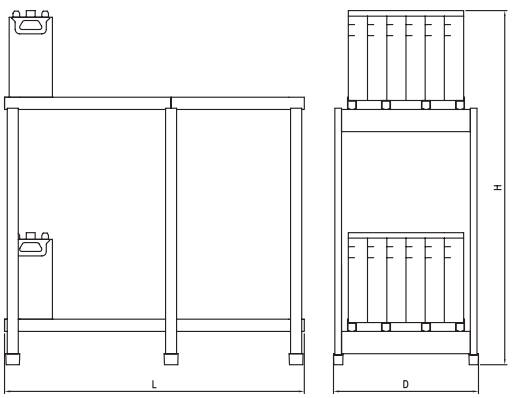


Diagram 10
2 tier, 1 step, crosswise connection

H Range

Cell performance **H** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	0.97	1.54	2.51	3.66	4.74	6.64	9.79	12.0	13.5	15.9	20.3	31.9	37.2	45.3	54.4
SBH 12	12	1.40	2.22	3.62	5.29	6.86	9.60	14.2	17.3	19.5	22.9	29.3	46.2	53.8	65.5	78.6
SBH 16	16	1.87	2.96	4.83	7.05	9.14	12.8	18.9	23.0	26.1	30.6	39.1	61.6	71.8	87.3	105
SBH 19	19	2.22	3.52	5.76	8.42	10.9	15.4	23.0	28.1	31.7	37.0	47.1	74.1	85.8	107	112
SBH 29	29	3.39	5.37	8.79	12.8	16.6	23.5	35.1	42.9	48.4	56.5	71.9	113	131	163	172
SBH 39	39	4.56	7.22	11.8	17.3	22.3	31.6	47.2	57.7	65.1	76.0	96.7	152	176	220	231
SBH 49	49	5.73	9.07	14.8	21.7	28.1	39.7	59.3	72.5	81.8	95.5	122	191	221	276	290
SBH 59	59	6.90	10.9	17.9	26.1	33.8	47.8	71.4	87.3	98.5	115	146	230	266	332	349
SBH 69	69	8.07	12.8	20.9	30.6	39.5	55.9	83.5	102	115	135	171	269	311	389	408
SBH 79	79	9.24	14.6	23.9	35.0	45.3	64.0	95.6	117	132	154	196	308	357	445	468
SBH 88	88	10.3	16.3	26.7	39.0	50.4	71.3	107	130	147	172	218	343	397	496	521
SBH 98	98	11.5	18.1	29.7	43.4	56.2	79.4	119	145	164	191	243	382	442	552	580
SBH 118	118	13.8	21.8	35.8	52.3	67.6	95.6	143	175	197	230	293	460	533	665	698
SBH 137	137	16.0	25.3	41.5	60.7	78.5	111	166	203	229	267	340	535	618	772	811
SBH 157	157	18.4	29.0	47.6	69.6	90.0	127	190	232	262	306	389	613	709	885	929
SBH 177	177	20.7	32.7	53.6	78.4	101	143	214	262	296	345	439	691	799	997	1047
SBH 196	196	22.9	36.3	59.4	86.8	112	159	237	290	327	382	486	765	885	1104	1160
SBH 236	236	27.6	43.7	71.5	105	135	191	286	349	394	460	585	921	1065	1330	1397
SBH 265	265	31.0	49.0	80.3	117	152	215	321	392	443	517	657	1034	1196	1493	1568
SBH 294	294	34.4	54.4	89.1	130	168	238	356	435	491	573	729	1147	1327	1656	1740
SBH 353	353	41.3	65.3	107	156	202	286	427	523	589	688	875	1377	1594	1989	2089
SBH 393	393	46.0	72.7	119	174	225	318	476	582	656	766	975	1533	1774	2214	2326
SBH 471	471	55.1	87.1	143	209	270	382	570	697	787	918	1168	1838	2126	2654	2787
SBH 491	491	57.4	90.8	149	218	281	398	594	727	820	957	1218	1916	2217	2766	2906
SBH 590	590	69.0	109	179	261	338	478	714	873	985	1150	1463	2302	2663	3324	3492
SBH 640	640	74.9	118	193	283	366	512	758	919	1030	1187	1507	2273	2606	3067	3175
SBH 705	705	82.5	130	213	312	403	564	835	1012	1135	1308	1660	2504	2871	3378	3497
SBH 765	765	89.5	142	231	338	438	612	906	1098	1231	1419	1802	2717	3115	3666	3795
SBH 865	865	101	160	261	382	495	692	1025	1242	1392	1605	2037	3072	3523	4145	4291
SBH 920	920	108	170	278	407	526	736	1090	1321	1481	1707	2167	3268	3746	4408	4563

Cell performance **H** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.00	1.59	2.61	3.84	5.02	7.14	11.7	14.3	16.3	19.1	24.2	37.1	43.2	54.6	57.5
SBH 12	12	1.45	2.30	3.78	5.56	7.26	10.3	16.9	20.6	23.5	27.6	34.9	53.7	62.4	78.9	83.1
SBH 16	16	1.94	3.07	5.04	7.41	9.68	13.8	22.6	27.5	31.4	36.8	46.6	71.6	83.2	105	111
SBH 19	19	2.30	3.65	5.99	8.80	11.5	16.5	27.5	33.7	38.4	44.9	56.5	86.5	100	123	137
SBH 29	29	3.51	5.57	9.14	13.4	17.6	25.2	42.0	51.4	58.6	68.5	86.2	132	153	187	210
SBH 39	39	4.72	7.49	12.3	18.1	23.6	33.9	56.5	69.1	78.8	92.1	116	178	205	252	282
SBH 49	49	5.93	9.41	15.4	22.7	29.7	42.6	71.0	86.8	99.0	116	146	223	258	316	354
SBH 59	59	7.14	11.3	18.6	27.3	35.8	51.3	85.5	104	119	139	175	269	311	381	427
SBH 69	69	8.35	13.2	21.7	31.9	41.8	60.0	100	122	139	163	205	314	363	445	499
SBH 79	79	9.56	15.2	24.9	36.6	47.9	68.7	114	140	160	186	235	360	416	510	571
SBH 88	88	10.6	16.9	27.7	40.7	53.3	76.6	128	156	178	208	262	401	463	568	636
SBH 98	98	11.9	18.8	30.9	45.4	59.4	85.3	142	174	198	231	291	446	516	632	709
SBH 118	118	14.3	22.7	37.2	54.6	71.5	103	171	209	239	279	351	537	621	761	853
SBH 137	137	16.6	26.3	43.2	63.4	83	119	199	243	277	323	407	624	721	884	990
SBH 157	157	19.0	30.1	49.5	72.7	95	137	228	278	317	371	467	715	826	1013	1135
SBH 177	177	21.4	34.0	55.8	82.0	107	154	257	313	358	418	526	806	932	1142	1280
SBH 196	196	23.7	37.6	61.7	90.7	119	171	284	347	396	463	582	892	1032	1264	1417
SBH 236	236	28.6	45.3	74.3	109	143	205	342	418	477	557	701	1074	1242	1522	1706
SBH 265	265	32.1	50.9	83.5	123	161	231	384	469	536	626	788	1207	1395	1709	1916
SBH 294	294	35.6	56.4	92.6	136	178	256	426	521	594	694	874	1339	1547	1896	2126
SBH 353	353	42.7	67.8	111	163	214	307	512	625	714	833	1049	1607	1858	2277	2552
SBH 393	393	47.6	75.5	124	182	238	342	570	696	794	928	1168	1789	2068	2535	2841
SBH 471	471	57.0	90.4	148	218	285	410	683	834	952	1112	1400	2144	2479	3038	3405
SBH 491	491	59.4	94.3	155	227	298	427	712	870	993	1159	1459	2235	2584	3167	3550
SBH 590	590	71.4	113	186	273	358	513	855	1045	1193	1393	1753	2686	3105	3805	4265
SBH 640	640	77.4	123	202	296	387	557	915	1095	1244	1443	1780	2664	3030	3606	3789
SBH 705	705	85.3	135	222	326	427	613	1008	1207	1370	1589	1961	2934	3337	3973	4174
SBH 765	765	92.6	147	241	354	463	666	1094	1309	1487	1725	2127	3184	3621	4311	4530
SBH 865	865	105	166	272	400	523	753	1237	1481	1681	1950	2405	3600	4095	4874	5122
SBH 920	920	111	177	290	426	557	800	1315	1575	1788	2074	2558	3829	4355	5184	5447

Cell performance **H** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.03	1.64	2.69	3.97	5.21	7.55	13.4	16.9	19.2	22.7	28.7	43.8	51.5	62.9	67.9
SBH 12	12	1.49	2.36	3.89	5.74	7.54	10.9	19.3	24.5	27.8	32.9	41.5	63.3	74.4	90.9	98.1
SBH 16	16	1.98	3.15	5.18	7.65	10.1	14.6	25.8	32.6	37.1	43.8	55.4	84.4	99.3	121	131
SBH 19	19	2.36	3.74	6.16	9.10	11.9	17.3	31.0	40.1	45.4	53.7	67.5	103	117	145	155
SBH 29	29	3.60	5.71	9.40	13.9	18.2	26.4	47.3	61.2	69.3	82.0	103	157	179	221	237
SBH 39	39	4.84	7.68	12.6	18.7	24.5	35.5	63.6	82.3	93.2	110	139	211	241	297	319
SBH 49	49	6.08	9.65	15.9	23.5	30.8	44.6	79.9	103	117	139	174	265	302	373	401
SBH 59	59	7.32	11.6	19.1	28.3	37	54	96	124	141	167	210	319	364	450	482
SBH 69	69	8.56	13.6	22.4	33.1	43	63	113	146	165	195	245	374	426	526	564
SBH 79	79	9.80	15.6	25.6	37.8	50	72	129	167	189	223	281	428	488	602	646
SBH 88	88	10.9	17.3	28.5	42.2	55	80	144	186	210	249	313	476	543	671	719
SBH 98	98	12.2	19.3	31.8	46.9	62	89	160	207	234	277	348	531	605	747	801
SBH 118	118	14.6	23.2	38.2	56.5	74	107	192	249	282	334	419	639	728	899	965
SBH 137	137	17.0	27.0	44.4	65.6	86	125	223	289	327	387	487	742	846	1044	1120
SBH 157	157	19.5	30.9	50.9	75.2	99	143	256	331	375	444	558	850	969	1196	1284
SBH 177	177	21.9	34.9	57.3	84.8	111	161	289	373	423	500	629	958	1093	1349	1447
SBH 196	196	24.3	38.6	63.5	93.9	123	178	320	413	468	554	697	1061	1210	1494	1602
SBH 236	236	29.3	46.5	76.5	113	148	215	385	498	564	667	839	1278	1457	1799	1930
SBH 265	265	32.9	52.2	85.9	127	167	241	432	559	633	749	942	1435	1636	2020	2167
SBH 294	294	36.5	57.9	95.3	141	185	268	480	620	702	831	1045	1592	1815	2241	2404
SBH 353	353	43.8	69.5	114	169	222	321	576	745	843	998	1255	1911	2179	2690	2886
SBH 393	393	48.7	77.4	127	188	247	358	641	829	939	1111	1397	2128	2426	2995	3213
SBH 471	471	58.4	92.8	153	226	296	429	768	994	1125	1331	1674	2550	2907	3589	3851
SBH 491	491	60.9	96.7	159	235	309	447	801	1036	1173	1388	1745	2659	3031	3742	4014
SBH 590	590	73.2	116	191	283	371	537	962	1245	1409	1668	2097	3195	3642	4496	4824
SBH 640	640	79.4	126	207	307	402	582	1037	1325	1482	1739	2146	3135	3538	4268	4449
SBH 705	705	87.4	139	228	338	443	642	1142	1460	1633	1916	2364	3453	3898	4702	4901
SBH 765	765	94.9	151	248	366	480	696	1239	1584	1772	2079	2565	3747	4229	5102	5318
SBH 865	865	107	170	280	414	543	787	1401	1791	2003	2351	2900	4237	4782	5769	6013
SBH 920	920	114	181	298	441	578	837	1490	1905	2130	2500	3084	4506	5086	6136	6395

Cell performance **H** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBH 8.3	8.3	1.04	1.66	2.73	4.05	5.33	7.80	14.1	18.8	21.9	25.9	33.1	51.2	57.8	73.2	77.8
SBH 12	12	1.50	2.40	3.95	5.86	7.70	11.3	20.4	27.2	31.6	37.5	47.8	74.0	83.5	106	112
SBH 16	16	2.00	3.20	5.26	7.81	10.3	15.0	27.2	36.3	42.2	50.0	63.8	98.7	111	141	150
SBH 19	19	2.38	3.80	6.25	9.27	12.2	17.9	32.7	44.1	51.7	61.4	78.2	117	133	168	184
SBH 29	29	3.63	5.80	9.54	14.2	18.6	27.3	49.9	67.3	78.9	93.6	119	178	203	256	281
SBH 39	39	4.88	7.80	12.8	19.0	25.1	36.7	67.1	90.5	106	126	161	239	273	344	377
SBH 49	49	6.13	9.80	16.1	23.9	31.5	46.1	84.3	114	133	158	202	301	343	432	474
SBH 59	59	7.38	11.8	19.4	28.8	37.9	55.5	102	137	160	191	243	362	413	520	571
SBH 69	69	8.63	13.8	22.7	33.7	44.4	64.8	119	160	188	223	284	423	483	608	668
SBH 79	79	9.88	15.8	26.0	38.6	50.8	74.2	136	183	215	255	325	485	553	697	765
SBH 88	88	11.0	17.6	29.0	42.9	56.6	82.7	151	204	239	284	362	540	616	776	852
SBH 98	98	12.3	19.6	32.2	47.8	63.0	92.1	169	227	267	316	403	601	686	864	949
SBH 118	118	14.8	23.6	38.8	57.6	75.9	111	203	274	321	381	486	724	826	1041	1142
SBH 137	137	17.1	27.4	45.1	66.9	88.1	129	236	318	373	442	564	841	959	1208	1326
SBH 157	157	19.6	31.4	51.7	76.6	101	148	270	364	427	507	646	963	1099	1384	1520
SBH 177	177	22.1	35.4	58.2	86.4	114	166	305	411	481	572	729	1086	1239	1561	1713
SBH 196	196	24.5	39.2	64.5	95.6	126	184	337	455	533	633	807	1203	1373	1728	1897
SBH 236	236	29.5	47.2	77.6	115	152	222	406	548	642	762	972	1448	1653	2081	2284
SBH 265	265	33.1	53.0	87.2	129	170	249	456	615	721	856	1091	1626	1856	2337	2565
SBH 294	294	36.8	58.8	96.7	143	189	276	506	682	800	949	1210	1804	2059	2593	2846
SBH 353	353	44.1	70.6	116	172	227	332	608	819	960	1140	1453	2166	2472	3113	3417
SBH 393	393	49.1	78.6	129	192	253	369	676	912	1069	1269	1618	2412	2752	3466	3804
SBH 471	471	58.9	94.2	155	230	303	443	811	1093	1281	1521	1939	2890	3298	4153	4559
SBH 491	491	61.4	98.2	162	240	316	461	845	1139	1336	1585	2022	3013	3438	4330	4752
SBH 590	590	73.8	118	194	288	379	555	1015	1369	1605	1905	2429	3621	4132	5203	5710
SBH 640	640	80.0	128	211	312	411	602	1092	1468	1700	1997	2490	3602	4066	4944	5259
SBH 705	705	88.1	141	232	344	453	663	1203	1617	1872	2200	2743	3968	4479	5446	5793
SBH 765	765	95.6	153	252	373	491	719	1305	1755	2032	2387	2976	4306	4860	5910	6286
SBH 865	865	108	173	285	422	555	813	1476	1984	2297	2699	3366	4869	5496	6682	7108
SBH 920	920	115	184	303	449	591	865	1570	2110	2443	2871	3580	5179	5845	7107	7560

M Range

Cell performance **M** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.06	1.32	2.07	3.28	4.52	5.41	6.60	8.80	10.3	11.6	13.2	16.2	24.1	27.3	32.6	36.1
SBM 15	15	1.45	1.80	2.82	4.47	6.16	7.38	9.00	12.0	14.1	15.8	18.0	22.1	32.8	37.2	44.4	49.2
SBM 22	22	2.13	2.64	4.14	6.58	9.11	11.0	13.2	17.8	20.7	22.9	26.2	31.5	44.4	49.9	58.1	60.0
SBM 30	30	2.90	3.60	5.64	8.97	12.4	15.0	18.0	24.3	28.2	31.2	35.7	42.9	60.6	68.0	79.2	81.9
SBM 43	43	4.16	5.16	8.08	12.9	18.1	22.1	27.1	36.6	42.6	47.7	54.2	65.4	93.7	105	122	128
SBM 56	56	5.42	6.72	10.5	16.8	23.5	28.8	35.3	47.0	54.9	60.5	68.9	82.3	115	128	148	153
SBM 65	65	6.29	7.80	12.2	19.5	27.4	33.5	40.9	55.3	64.4	72.1	81.9	98.8	142	159	185	193
SBM 84	84	8.12	10.1	15.8	25.2	35.3	43.2	52.9	70.6	82.3	90.7	103	124	173	192	222	229
SBM 112	112	10.8	13.4	21.1	33.6	47.0	57.6	70.5	94.1	110	121	138	165	231	256	296	305
SBM 138	138	13.3	16.6	25.9	41.4	58.0	70.9	86.9	116	135	149	170	203	284	316	365	376
SBM 161	161	15.6	19.3	30.3	48.3	67.6	82.8	101	135	158	174	198	237	331	369	425	439
SBM 184	184	17.8	22.1	34.6	55.2	77.3	94.6	116	155	180	199	226	271	379	421	486	501
SBM 208	208	20.1	25.0	39.1	62.4	87.4	107	131	175	204	225	256	306	428	476	549	567
SBM 231	231	22.3	27.7	43.4	69.3	97.0	119	146	194	226	249	284	340	476	529	610	629
SBM 277	277	26.8	33.2	52.1	83.1	116	142	174	233	271	299	341	407	570	634	732	754
SBM 300	300	29.0	36.0	56.4	90.0	126	154	189	252	294	324	369	441	618	687	792	817
SBM 323	323	31.2	38.8	60.7	96.9	136	166	203	271	316	349	397	475	665	739	853	880
SBM 346	346	33.5	41.5	65.0	104	145	178	218	291	339	374	426	509	712	792	914	942
SBM 369	369	35.7	44.3	69.4	111	155	190	232	310	362	399	454	543	760	845	975	1005
SBM 392	392	37.9	47.0	73.7	118	165	201	247	329	384	423	482	576	807	897	1036	1068
SBM 415	415	40.1	49.8	78.0	124	174	213	261	349	407	448	511	610	854	950	1096	1130
SBM 438	438	42.4	52.6	82.3	131	184	225	276	368	429	473	539	644	902	1003	1157	1193
SBM 461	461	44.6	55.3	86.7	138	194	237	290	387	452	498	567	678	949	1055	1218	1256
SBM 505	505	48.8	60.6	94.9	151	212	260	318	424	495	545	621	743	1040	1156	1334	1375
SBM 555	555	53.7	66.6	104	166	233	285	350	466	544	599	683	816	1143	1270	1466	1512
SBM 625	625	60.4	75.0	118	187	263	321	394	525	612	675	769	919	1287	1431	1651	1702
SBM 690	690	66.7	82.8	130	207	290	355	435	580	676	745	849	1015	1420	1580	1823	1879
SBM 740	740	71.6	88.8	139	222	311	380	466	622	725	799	911	1088	1523	1694	1955	2015
SBM 830	830	80.3	99.6	156	249	349	427	523	697	813	896	1021	1220	1709	1900	2193	2261
SBM 920	920	89.0	110	173	276	386	473	579	773	901	994	1132	1353	1894	2106	2430	2506
SBM 965	965	93.3	116	181	289	405	496	608	811	945	1042	1187	1419	1987	2209	2549	2628
SBM 1040	1040	101	125	196	312	437	535	655	874	1019	1123	1280	1529	2141	2381	2747	2833
SBM 1150	1150	111	138	216	345	483	591	724	966	1127	1242	1415	1691	2367	2633	3038	3132
SBM 1220	1220	118	146	229	366	512	627	768	1025	1195	1318	1501	1794	2512	2793	3223	3323
SBM 1390	1390	134	167	261	417	584	714	876	1168	1362	1501	1710	2044	2862	3182	3672	3786

Cell performance **M** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.09	1.35	2.15	3.43	4.85	6.03	7.59	10.2	12.0	13.3	15.4	18.9	27.8	31.8	38.9	41.2
SBM 15	15	1.49	1.85	2.93	4.68	6.62	8.22	10.4	14.0	16.3	18.1	21.0	25.8	37.9	43.4	53.1	56.2
SBM 22	22	2.18	2.71	4.29	6.86	9.75	12.1	15.4	20.7	24.2	26.6	30.3	36.8	52.2	58.4	69.3	73.8
SBM 30	30	2.97	3.69	5.85	9.36	13.3	16.6	21.0	28.2	33.0	36.3	41.4	50.1	71.1	79.6	94.5	101
SBM 43	43	4.26	5.29	8.39	13.5	19.2	24.3	31.4	42.6	50.3	55.5	63.2	76.6	108	123	145	168
SBM 56	56	5.55	6.89	10.9	17.5	25.0	31.6	40.9	54.9	64.4	70.6	80.6	96.3	134	150	177	188
SBM 65	65	6.44	8.00	12.7	20.3	29.1	36.7	47.5	64.4	76.0	83.8	95.6	116	164	185	220	254
SBM 84	84	8.32	10.3	16.4	26.3	37.6	47.4	61.3	82.3	96.6	106	121	144	202	225	265	282
SBM 112	112	11.1	13.8	21.8	35.1	50.1	63.2	81.8	110	129	141	161	193	269	300	354	376
SBM 138	138	13.7	17.0	26.9	43.2	61.7	77.8	101	135	159	174	199	237	331	370	436	463
SBM 161	161	16.0	19.8	31.4	50.4	72.0	90.8	118	158	185	203	232	277	386	431	508	540
SBM 184	184	18.2	22.6	35.9	57.6	82.3	104	134	180	212	232	265	316	441	493	581	617
SBM 208	208	20.6	25.6	40.6	65.1	93.0	117	152	204	239	262	300	358	499	557	657	698
SBM 231	231	22.9	28.4	45.0	72.3	103	130	169	226	266	291	333	397	554	619	729	775
SBM 277	277	27.4	34.1	54.0	86.7	124	156	202	271	319	349	399	476	665	742	875	929
SBM 300	300	29.7	36.9	58.5	93.9	134	169	219	294	345	378	432	516	720	803	947	1006
SBM 323	323	32.0	39.7	63.0	101	144	182	236	317	372	407	465	555	775	865	1020	1083
SBM 346	346	34.3	42.6	67.5	108	155	195	253	339	398	436	498	595	830	926	1093	1160
SBM 369	369	36.6	45.4	72.0	116	165	208	269	362	424	465	531	635	885	988	1165	1237
SBM 392	392	38.8	48.2	76.4	123	175	221	286	384	451	494	565	674	941	1050	1238	1315
SBM 415	415	41.1	51.0	80.9	130	186	234	303	407	477	523	598	714	996	1111	1311	1392
SBM 438	438	43.4	53.9	85.4	137	196	247	320	429	504	552	631	753	1051	1173	1383	1469
SBM 461	461	45.7	56.7	89.9	144	206	260	337	452	530	581	664	793	1106	1234	1456	1546
SBM 505	505	50.0	62.1	98.5	158	226	285	369	495	581	636	727	868	1212	1352	1595	1693
SBM 555	555	55.0	68.3	108	174	248	313	405	544	638	699	799	954	1332	1486	1753	1861
SBM 625	625	61.9	76.9	122	196	279	353	456	612	719	788	900	1075	1500	1674	1974	2096
SBM 690	690	68.4	84.9	135	216	308	389	504	676	794	870	994	1187	1656	1848	2179	2314
SBM 740	740	73.3	91.0	144	232	331	417	540	725	851	933	1066	1273	1776	1981	2337	2482
SBM 830	830	82.2	102	162	260	371	468	606	813	955	1046	1195	1427	1992	2222	2621	2783
SBM 920	920	91.2	113	179	288	411	519	672	902	1058	1160	1325	1582	2207	2463	2905	3085
SBM 965	965	95.6	119	188	302	431	544	704	946	1110	1216	1390	1660	2315	2584	3047	3236
SBM 1040	1040	103	128	203	326	465	587	759	1019	1196	1311	1498	1789	2495	2785	3284	3488
SBM 1150	1150	114	141	224	360	514	649	840	1127	1323	1449	1656	1978	2759	3079	3632	3856
SBM 1220	1220	121	150	238	382	545	688	891	1196	1403	1538	1757	2098	2927	3267	3853	4091
SBM 1390	1390	138	171	271	435	621	784	1015	1362	1599	1752	2002	2390	3335	3722	4390	4661

Cell performance **M** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.11	1.38	2.18	3.54	5.10	6.47	8.58	11.8	13.9	15.4	17.7	21.9	32.3	37.2	45.8	49.5
SBM 15	15	1.51	1.88	2.97	4.83	6.96	8.82	11.7	16.1	18.9	21.0	24.2	29.9	44.1	50.8	62.5	67.6
SBM 22	22	2.22	2.75	4.36	7.08	10.3	13.0	17.4	24.0	27.9	31.0	35.4	42.9	60.5	68.7	81.5	87.8
SBM 30	30	3.02	3.75	5.94	9.66	14.0	17.8	23.7	32.7	38.1	42.3	48.3	58.5	82.5	93.7	111	120
SBM 43	43	4.33	5.38	8.51	13.9	20.1	25.8	35.3	49.9	58.0	64.1	74.0	89.9	127	144	173	186
SBM 56	56	5.64	7.00	11.1	18.1	26.2	33.6	45.9	64.4	75.0	82.9	94.1	113	157	177	208	224
SBM 65	65	6.55	8.13	12.9	21.0	30.4	39.0	53.3	75.4	87.7	96.9	112	136	192	217	262	280
SBM 84	84	8.46	10.5	16.6	27.1	39.3	50.4	68.9	96.6	113	124	141	170	235	265	312	336
SBM 112	112	11.3	14.0	22.2	36.2	52.4	67.2	91.9	129	150	166	188	226	314	353	416	448
SBM 138	138	13.9	17.3	27.3	44.6	64.6	82.8	113	159	185	204	232	279	387	435	513	553
SBM 161	161	16.2	20.1	31.9	52.0	75.4	96.6	132	185	216	238	271	325	451	507	598	645
SBM 184	184	18.5	23.0	36.4	59.4	86.1	110	151	212	247	272	309	372	515	580	683	737
SBM 208	208	20.9	26.0	41.2	67.2	97.4	125	171	239	279	308	350	420	583	656	773	833
SBM 231	231	23.3	28.9	45.7	74.6	108	139	189	266	310	342	388	467	647	728	858	925
SBM 277	277	27.9	34.6	54.8	89.5	130	166	227	319	371	410	465	560	776	873	1029	1109
SBM 300	300	30.2	37.5	59.4	96.9	140	180	246	345	402	444	504	606	840	946	1114	1201
SBM 323	323	32.5	40.4	63.9	104	151	194	265	371	433	478	543	653	905	1018	1200	1293
SBM 346	346	34.8	43.3	68.5	112	162	208	284	398	464	512	581	699	969	1091	1285	1385
SBM 369	369	37.2	46.1	73.1	119	173	221	303	424	494	546	620	745	1034	1163	1370	1477
SBM 392	392	39.5	49.0	77.6	127	183	235	321	451	525	580	659	792	1098	1236	1456	1570
SBM 415	415	41.8	51.9	82.2	134	194	249	340	477	556	614	697	838	1162	1308	1541	1662
SBM 438	438	44.1	54.8	86.7	141	205	263	359	504	587	648	736	885	1227	1381	1627	1754
SBM 461	461	46.4	57.6	91.3	149	216	277	378	530	618	682	775	931	1291	1453	1712	1846
SBM 505	505	50.9	63.1	100	163	236	303	414	581	677	747	849	1020	1415	1592	1876	2022
SBM 555	555	55.9	69.4	110	179	260	333	455	638	744	821	933	1121	1555	1749	2061	2222
SBM 625	625	62.9	78.1	124	202	293	375	513	719	837	925	1050	1263	1751	1970	2321	2503
SBM 690	690	69.5	86.3	137	223	323	414	566	793	925	1021	1160	1394	1933	2175	2563	2763
SBM 740	740	74.5	92.5	147	239	346	444	607	851	992	1095	1244	1495	2073	2333	2748	2963
SBM 830	830	83.6	104	164	268	388	498	681	954	1112	1228	1395	1677	2325	2616	3083	3323
SBM 920	920	92.6	115	182	297	431	552	755	1058	1233	1362	1546	1859	2577	2900	3417	3684
SBM 965	965	97.2	121	191	312	452	579	791	1110	1293	1428	1622	1949	2703	3042	3584	3864
SBM 1040	1040	105	130	206	336	487	624	853	1196	1394	1539	1748	2101	2913	3278	3863	4164
SBM 1150	1150	116	144	228	371	538	690	943	1322	1541	1702	1933	2323	3221	3625	4271	4605
SBM 1220	1220	123	153	242	394	571	732	1001	1403	1635	1806	2050	2465	3417	3846	4531	4885
SBM 1390	1390	140	174	275	449	651	834	1140	1598	1862	2057	2336	2808	3894	4381	5162	5566

Cell performance **M** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBM 11	11	1.12	1.39	2.20	3.60	5.24	6.74	9.24	13.2	15.5	17.3	19.9	24.7	36.7	42.0	52.9	58.3
SBM 15	15	1.52	1.89	3.00	4.91	7.14	9.20	12.6	18.0	21.1	23.6	27.1	33.7	50.0	57.3	72.1	79.4
SBM 22	22	2.23	2.77	4.40	7.19	10.5	13.5	18.7	26.8	31.5	34.8	39.8	48.6	69.3	78.1	94.2	99.6
SBM 30	30	3.04	3.78	6.00	9.81	14.3	18.5	25.5	36.6	42.9	47.4	54.3	66.3	94.5	107	128	136
SBM 43	43	4.36	5.42	8.60	14.1	20.6	26.7	37.0	55.9	65.4	72.6	83.5	102	144	163	198	212
SBM 56	56	5.68	7.06	11.2	18.3	26.8	34.7	48.1	72.3	84.5	93.6	107	129	180	202	241	255
SBM 65	65	6.60	8.19	13.0	21.3	31.1	40.3	55.9	84.5	98.8	110	126	154	218	247	300	320
SBM 84	84	8.53	10.6	16.8	27.5	40.2	52.1	72.2	108	127	140	161	194	271	303	361	382
SBM 112	112	11.4	14.1	22.4	36.6	53.5	69.5	96.3	145	169	187	214	259	361	403	481	509
SBM 138	138	14.0	17.4	27.6	45.1	66.0	85.6	119	178	208	231	264	319	445	497	593	627
SBM 161	161	16.3	20.3	32.2	52.6	77.0	99.8	138	208	243	269	308	372	519	580	692	732
SBM 184	184	18.7	23.2	36.8	60.2	88.0	114	158	237	278	307	352	425	593	663	790	836
SBM 208	208	21.1	26.2	41.6	68.0	99.4	129	179	268	314	347	398	481	670	749	893	945
SBM 231	231	23.4	29.1	46.2	75.5	110	143	199	298	349	386	442	534	744	832	992	1050
SBM 277	277	28.1	34.9	55.4	90.6	132	172	238	357	418	463	529	640	892	998	1190	1259
SBM 300	300	30.4	37.8	60.0	98.1	143	186	258	387	453	501	573	693	966	1081	1289	1364
SBM 323	323	32.8	40.7	64.6	106	154	200	278	417	488	540	617	746	1041	1164	1387	1468
SBM 346	346	35.1	43.6	69.2	113	165	215	297	447	522	578	661	799	1115	1246	1486	1573
SBM 369	369	37.5	46.5	73.8	121	176	229	317	476	557	616	705	853	1189	1329	1585	1677
SBM 392	392	39.8	49.4	78.4	128	187	243	337	506	592	655	749	906	1263	1412	1684	1782
SBM 415	415	42.1	52.3	83.0	136	198	257	357	536	626	693	793	959	1337	1495	1783	1886
SBM 438	438	44.5	55.2	87.6	143	209	272	377	565	661	732	837	1012	1411	1578	1881	1991
SBM 461	461	46.8	58.1	92.2	151	220	286	396	595	696	770	881	1065	1485	1661	1980	2095
SBM 505	505	51.3	63.6	101	165	241	313	434	652	762	844	965	1167	1627	1819	2169	2295
SBM 555	555	56.3	69.9	111	181	265	344	477	716	838	927	1061	1282	1788	1999	2384	2523
SBM 625	625	63.4	78.7	125	204	299	388	537	807	943	1044	1195	1444	2014	2251	2685	2841
SBM 690	690	70.0	86.9	138	226	330	428	593	890	1041	1153	1319	1594	2223	2486	2964	3136
SBM 740	740	75.1	93.2	148	242	354	459	636	955	1117	1236	1414	1710	2384	2666	3179	3364
SBM 830	830	84.2	105	166	271	397	515	714	1071	1253	1387	1586	1918	2674	2990	3565	3773
SBM 920	920	93.4	116	184	301	440	571	791	1187	1389	1537	1758	2126	2964	3314	3952	4182
SBM 965	965	97.9	122	193	316	461	598	830	1245	1456	1612	1844	2230	3109	3476	4145	4386
SBM 1040	1040	106	131	208	340	497	645	894	1342	1570	1737	1988	2403	3351	3746	4467	4727
SBM 1150	1150	117	145	230	376	550	713	989	1484	1736	1921	2198	2657	3705	4143	4940	5227
SBM 1220	1220	124	154	244	399	583	757	1049	1574	1841	2038	2332	2819	3930	4395	5241	5545
SBM 1390	1390	141	175	278	455	664	862	1195	1794	2098	2322	2657	3212	4478	5007	5971	6318

L Range

Cell performance **L** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.14 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.75	0.91	1.42	2.22	2.84	3.25	3.75	4.80	5.40	5.85	6.53	7.65	10.4	11.1	13.0	13.4
SBL 16	16	1.55	1.89	2.99	4.75	5.33	6.26	7.33	8.90	9.52	9.99	10.5	12.0	14.6	16.0	19.1	21.5
SBL 30	30	2.90	3.54	5.61	8.91	9.99	11.7	13.7	16.7	17.8	18.7	19.7	22.4	27.3	29.9	35.9	40.3
SBL 37	37	3.66	4.46	7.00	11.0	14.2	16.3	18.9	23.7	26.6	28.9	31.8	37.0	48.5	52.2	56.2	62.8
SBL 45	45	4.35	5.31	8.41	13.4	15.0	17.6	20.6	25.0	26.8	28.1	29.6	33.6	41.0	44.9	53.8	60.4
SBL 48	48	4.75	5.79	9.06	14.3	18.2	20.9	24.5	30.2	34.1	36.5	40.3	47.1	61.0	66.2	71.0	72.0
SBL 59	59	5.70	6.96	11.0	17.5	19.7	23.1	27.0	32.8	35.1	36.8	38.8	44.1	53.8	58.9	70.6	79.2
SBL 70	70	6.92	8.44	13.2	20.8	26.9	30.8	35.7	44.8	50.4	54.6	60.2	70.0	91.7	98.8	106	119
SBL 90	90	8.90	10.9	17.0	26.7	34.2	39.1	45.9	56.7	63.9	68.4	75.6	88.2	114	124	133	135
SBL 102	102	10.1	12.3	19.3	30.3	39.2	44.9	52.0	65.3	73.4	79.6	87.7	102	134	144	155	173
SBL 131	131	13.0	15.8	24.7	38.9	49.8	57.0	66.8	82.5	93.1	99.6	110	128	167	181	194	196
SBL 173	173	17.1	20.9	32.7	51.4	65.7	75.2	88.2	109	123	131	145	170	220	239	256	259
SBL 214	214	21.2	25.8	40.4	63.6	81.3	93.1	109	135	152	163	180	210	272	295	317	321
SBL 256	256	25.3	30.9	48.3	76.0	97.2	111	130	161	182	195	215	251	325	353	379	384
SBL 304	304	30.1	36.7	57.4	90.3	115	132	155	191	216	231	255	298	387	419	450	456
SBL 346	346	34.2	41.7	65.3	103	131	150	176	218	246	263	291	339	440	477	512	519
SBL 387	387	38.3	46.7	73.1	115	147	168	197	244	275	294	325	379	492	534	572	580
SBL 429	429	42.4	51.7	81.0	127	163	187	219	270	305	326	360	421	545	592	635	643
SBL 470	470	46.5	56.7	88.7	140	179	204	240	296	334	357	395	461	598	648	695	705
SBL 510	510	50.4	61.5	96.3	151	194	222	260	321	362	388	428	500	648	704	754	765
SBL 600	600	59.3	72.3	113	178	228	261	306	378	426	456	504	588	763	828	888	900
SBL 645	645	63.8	77.8	122	192	245	280	329	406	458	490	542	632	820	890	954	967
SBL 770	770	76.1	92.8	145	229	292	335	393	485	547	585	647	755	979	1062	1139	1155
SBL 860	860	85.0	104	162	255	327	374	438	542	611	654	722	843	1093	1187	1272	1290
SBL 1020	1020	101	123	193	303	387	444	520	642	725	775	857	1000	1297	1407	1509	1529
SBL 1070	1070	106	129	202	318	406	465	545	674	760	813	899	1049	1360	1476	1583	1604
SBL 1280	1280	127	154	242	380	486	557	652	806	909	973	1075	1255	1627	1766	1893	1919
SBL 1450	1450	143	175	274	431	551	631	739	913	1030	1102	1218	1422	1844	2001	2145	2174
SBL 1540	1540	152	186	291	457	585	670	785	970	1094	1170	1293	1510	1958	2125	2278	2309

Cell performance **L** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.10 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.76	0.93	1.46	2.31	3.16	3.70	4.35	5.55	6.30	6.83	7.58	8.93	11.9	13.0	14.5	14.9
SBL 16	16	1.61	1.96	3.11	4.90	6.72	8.16	9.68	11.4	12.3	12.8	13.6	14.7	17.8	19.3	22.9	25.7
SBL 30	30	3.02	3.68	5.83	9.18	12.6	15.3	18.2	21.3	23.1	24.0	25.4	27.6	33.3	36.1	42.9	48.2
SBL 37	37	3.75	4.57	7.18	11.4	15.8	18.8	22.2	27.8	31.4	33.7	37.0	43.6	55.5	60.2	67.1	72.5
SBL 45	45	4.53	5.51	8.74	13.8	18.9	22.9	27.2	32.0	34.6	36.0	38.1	41.4	50.0	54.2	64.4	72.3
SBL 48	48	4.89	5.95	9.31	14.8	20.3	24.1	28.3	35.5	39.8	42.7	47.0	55.7	71.1	76.3	82.5	83.5
SBL 59	59	5.94	7.23	11.5	18.1	24.8	30.1	35.7	41.9	45.4	47.2	50.0	54.3	65.5	71.1	84.4	94.8
SBL 70	70	7.10	8.65	13.6	21.6	29.9	35.6	42.0	52.5	59.5	63.7	70.0	82.6	105	114	127	137
SBL 90	90	9.16	11.2	17.5	27.7	38.1	45.2	53.1	66.5	74.6	80.1	88.2	104	133	143	155	157
SBL 102	102	10.4	12.6	19.8	31.4	43.6	51.9	61.2	76.5	86.7	92.8	102	120	153	166	185	200
SBL 131	131	13.3	16.2	25.4	40.3	55.5	65.7	77.3	96.8	109	117	128	152	194	208	225	228
SBL 173	173	17.6	21.4	33.5	53.3	73.3	86.8	102	128	143	154	169	201	256	275	297	301
SBL 214	214	21.8	26.5	41.5	65.9	90.7	107	126	158	177	190	210	248	317	340	368	372
SBL 256	256	26.1	31.7	49.6	78.8	108	128	151	189	212	228	251	297	379	407	440	445
SBL 304	304	30.9	37.7	58.9	93.6	129	153	179	225	252	270	298	353	450	483	523	529
SBL 346	346	35.2	42.9	67.1	107	147	174	204	256	287	308	339	401	512	550	595	602
SBL 387	387	39.4	48.0	75.0	119	164	194	228	286	321	344	379	449	573	615	665	673
SBL 429	429	43.7	53.2	83.2	132	182	215	253	317	356	382	420	497	635	682	737	746
SBL 470	470	47.8	58.2	91.1	145	199	236	277	347	390	418	460	545	696	747	808	818
SBL 510	510	51.9	63.2	98.9	157	216	256	301	377	423	454	500	591	755	810	877	887
SBL 600	600	61.1	74.3	116	185	254	301	354	443	498	534	588	696	888	953	1031	1044
SBL 645	645	65.7	79.9	125	199	273	324	380	477	535	574	632	748	955	1025	1109	1122
SBL 770	770	78.4	95.4	149	237	326	386	454	569	638	685	754	893	1140	1224	1324	1340
SBL 860	860	87.5	107	167	265	364	432	507	635	713	765	842	997	1273	1367	1478	1496
SBL 1020	1020	104	126	198	314	432	512	602	754	846	908	999	1183	1510	1621	1753	1775
SBL 1070	1070	109	133	207	329	453	537	631	791	887	952	1048	1241	1584	1700	1839	1862
SBL 1280	1280	130	159	248	394	542	642	755	946	1061	1139	1254	1484	1895	2034	2200	2227
SBL 1450	1450	148	180	281	446	614	728	855	1071	1202	1290	1420	1681	2147	2304	2493	2523
SBL 1540	1540	157	191	299	474	653	773	908	1138	1277	1370	1508	1786	2280	2447	2647	2680

Cell performance **L** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.05 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.5	0.77	0.95	1.49	2.38	3.36	4.14	5.03	6.45	7.28	7.95	8.85	10.5	13.9	15.0	17.3	17.9
SBL 16	16	1.62	2.00	3.17	4.99	6.97	8.49	10.5	13.4	14.5	15.1	15.9	17.7	21.8	23.5	27.8	32.2
SBL 30	30	3.04	3.75	5.94	9.36	13.1	15.9	19.8	25.1	27.1	28.3	29.9	33.1	40.9	44.0	52.2	60.3
SBL 37	37	3.78	4.66	7.33	11.8	16.7	20.8	25.5	32.6	36.6	40.0	44.0	51.1	65.5	71.0	77.3	85.6
SBL 45	45	4.57	5.63	8.91	14.0	19.6	23.9	29.6	37.7	40.6	42.4	44.8	49.7	61.3	66.0	78.3	90.5
SBL 48	48	4.91	6.05	9.50	15.2	21.6	26.8	32.6	41.3	46.6	50.4	56.2	64.8	82.5	89.2	99.8	106
SBL 59	59	5.99	7.38	11.7	18.4	25.7	31.3	38.9	49.4	53.3	55.6	58.7	65.2	80.4	86.5	103	119
SBL 70	70	7.16	8.82	13.9	22.3	31.6	39.3	48.3	61.6	69.3	75.6	83.3	96.7	124	134	146	162
SBL 90	90	9.20	11.3	17.8	28.6	40.5	50.2	61.2	77.4	87.3	94.4	105	122	155	167	187	199
SBL 102	102	10.4	12.8	20.2	32.5	46.0	57.3	70.4	89.8	101	110	121	141	181	196	213	236
SBL 131	131	13.4	16.5	25.9	41.6	58.9	73.1	89.1	113	127	137	153	177	225	244	272	289
SBL 173	173	17.7	21.8	34.2	54.9	77.8	96.5	118	149	168	182	203	234	297	322	360	382
SBL 214	214	21.9	27.0	42.4	68.0	96.3	119	145	184	208	225	251	289	368	398	445	473
SBL 256	256	26.2	32.2	50.7	81.3	115	143	174	220	248	269	300	346	440	476	532	565
SBL 304	304	31.1	38.3	60.2	96.6	137	170	207	262	295	319	356	411	523	565	632	671
SBL 346	346	35.4	43.6	68.5	110	156	193	235	298	336	363	405	467	595	643	719	764
SBL 387	387	39.6	48.7	76.6	123	174	216	263	333	375	406	453	523	665	719	805	855
SBL 429	429	43.9	54.0	84.9	136	193	239	292	369	416	450	502	580	738	797	892	947
SBL 470	470	48.1	59.2	93.0	149	211	262	320	404	456	493	550	635	808	874	977	1038
SBL 510	510	52.1	64.2	101	162	229	285	347	439	495	535	597	689	877	948	1060	1126
SBL 600	600	61.3	75.6	119	191	270	335	408	516	582	630	702	811	1032	1115	1247	1325
SBL 645	645	66.0	81.2	128	205	290	360	438	555	626	677	755	871	1109	1199	1341	1424
SBL 770	770	78.7	97.0	152	245	346	430	523	663	747	808	901	1040	1324	1431	1601	1700
SBL 860	860	87.9	108	170	273	387	480	585	740	834	902	1007	1162	1479	1599	1788	1899
SBL 1020	1020	104	128	202	324	459	569	693	878	989	1070	1194	1378	1754	1896	2121	2252
SBL 1070	1070	109	135	212	340	481	597	727	921	1038	1123	1253	1445	1840	1989	2225	2363
SBL 1280	1280	131	161	253	407	576	714	870	1101	1241	1343	1498	1729	2201	2379	2661	2826
SBL 1450	1450	148	183	287	461	652	809	986	1248	1406	1521	1697	1959	2493	2695	3015	3202
SBL 1540	1540	157	194	305	489	693	859	1047	1325	1494	1616	1803	2080	2648	2863	3202	3400

Cell performance **L** range for railway on-board applications:

Performance for fully charged cells by a constant current charge according to IEC 60623 standard

Available amperes at +20°C ± 5°C (+68°F ± 9°F)

Final voltage: 1.00 V/cell

Cell type	C_5 Ah	Hours							Minutes						Seconds		
		10	8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
SBL 7.5	7.50	0.77	0.95	1.50	2.42	3.47	4.38	5.62	7.28	8.32	9.00	10.1	11.9	15.7	17.3	19.7	20.1
SBL 16	16.0	1.64	2.02	3.20	5.09	7.20	8.94	11.2	14.7	16.3	17.3	18.7	21.0	25.7	27.4	32.4	36.4
SBL 30	30.0	3.07	3.79	6.00	9.55	13.5	16.8	21.0	27.6	30.6	32.4	35.0	39.4	48.3	51.5	60.7	68.3
SBL 37	37.0	3.81	4.70	7.40	12.0	17.2	21.8	28.5	36.6	41.8	45.1	50.3	58.1	74.7	81.0	90.6	98.0
SBL 45	45.0	4.61	5.68	9.00	14.3	20.3	25.2	31.5	41.4	45.9	48.6	52.5	59.1	72.4	77.2	91.1	102
SBL 48	48.0	4.95	6.10	9.60	15.5	22.3	28.1	36.0	46.6	53.3	57.6	63.8	73.4	94.5	102	115	119
SBL 59	59.0	6.05	7.45	11.8	18.8	26.6	33.0	41.3	54.3	60.2	63.7	68.9	77.5	94.9	101	119	134
SBL 70	70.0	7.22	8.89	14.0	22.7	32.5	41.2	53.9	69.3	79.1	85.4	95.2	110	141	153	171	185
SBL 90	90.0	9.28	11.4	18.0	29.1	41.8	52.7	67.5	87.3	99.9	108	120	138	177	192	216	223
SBL 102	102	10.5	13.0	20.4	33.1	47.4	60.0	78.5	101	115	124	139	160	206	223	250	270
SBL 131	131	13.5	16.6	26.2	42.3	60.8	76.8	98.2	127	145	157	174	200	258	279	315	325
SBL 173	173	17.8	22.0	34.6	55.9	80.3	101	130	168	192	208	230	265	341	369	416	429
SBL 214	214	22.1	27.2	42.8	69.1	99.3	125	160	208	237	257	285	327	421	456	514	531
SBL 256	256	26.4	32.5	51.2	82.7	119	150	192	248	284	307	340	392	504	546	615	635
SBL 304	304	31.3	38.6	60.8	98.2	141	178	228	295	337	365	404	465	598	648	730	755
SBL 346	346	35.7	43.9	69.2	112	161	203	259	336	384	415	460	529	681	737	831	859
SBL 387	387	39.9	49.1	77.4	125	180	227	290	375	429	464	515	592	762	825	930	961
SBL 429	429	44.2	54.5	85.8	139	199	251	322	416	476	515	570	656	845	914	1030	1065
SBL 470	470	48.5	59.7	94.0	152	218	275	352	456	522	564	625	719	925	1002	1129	1167
SBL 510	510	52.6	64.8	102	165	237	299	382	495	566	612	678	780	1004	1087	1225	1266
SBL 600	600	61.9	76.2	120	194	278	352	450	582	666	720	798	918	1181	1279	1441	1489
SBL 645	645	66.5	81.9	129	208	299	378	484	626	716	774	858	987	1270	1375	1549	1601
SBL 770	770	79.4	97.8	154	249	357	451	577	747	854	924	1024	1178	1516	1641	1849	1911
SBL 860	860	88.7	109	172	278	399	504	645	834	954	1032	1144	1316	1693	1833	2066	2135
SBL 1020	1020	105	130	204	329	473	598	765	989	1132	1224	1356	1561	2008	2174	2450	2532
SBL 1070	1070	110	136	214	346	496	627	802	1038	1187	1284	1423	1637	2106	2280	2570	2656
SBL 1280	1280	132	163	256	413	594	750	960	1242	1420	1536	1702	1958	2520	2728	3074	3177
SBL 1450	1450	149	184	290	468	673	850	1087	1407	1609	1740	1928	2218	2854	3090	3483	3599
SBL 1540	1540	159	196	308	497	714	902	1155	1494	1709	1848	2048	2356	3032	3282	3699	3822