

Statement of Battery Compliance/Stationary Battery Worksheet 2021 International Fire Code (IFC) – Lead Acid Battery Threshold Limits

Carrier: T-Mobile
Site ID and Name: SE02629A Mercer Island Water Tank
Address: 4350 88th Ave SE, Mercer Island, WA 98040

Compliance with IFC 2021 total energy capacity (kilowatt-hours – kWh) threshold

The final maximum quantity of batteries in the battery cabinet/rack will be (16) Energys Powersafe SBS-190F or equivalent batteries (see attached technical specifications)

Total maximum final quantity of batteries:	16
Battery type:	Valve regulated lead acid (VRLA)
Battery model:	Energys Powersafe SBS-190F lead acid batteries (or equal)
Battery voltage:	12 volts (V)
Amp-hours (AH) for each battery:	190 Amp hours (AH)
Total Watt-hours (Wh) per battery:	12V x 190AH = 2,280 Watt-hours (Wh)
Total kilowatt-hours/battery (Wh÷1,000):	2,280 Watt-hours (Wh) ÷ 1,000 = 2.28 kWh
16 total batteries x 2.28 kWh per battery	36.48 total kilowatt-hours (kWh)

2021 International Fire Code (IFC) TABLE 1207.1.1 “ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES” shows that the threshold of total energy capacity for all types of lead-acid batteries is 70 kilowatt-hours (kWh).

As the above total of 36.48 kWh does not exceed the 70 kWh threshold, this installation is not required to be in compliance with 2021 International Fire Code (IFC) chapter 1207.1.

Total Electrolyte volume (if applicable):

Each battery contains 2.34 gallons of electrolyte for a total electrolyte volume of 34.44 gallons.
This is below the historic 50 gallon electrolyte threshold.

This project will be in compliance with all IFC battery thresholds.

Energys Powersafe SBS 190F Batteries



The Powersafe SBS 190F Front Terminal battery further extends the technical leadership of the Powersafe SBS 190F product range. Powersafe SBS 190F Front Terminal monoblocs retain the benefits of Thin Plate Pure Lead technology such as long life, high energy density superior shelf life. Alpine Power Systems is an approved platinum distributor of EnerSys products.

Powersafe SBS 190F General Specifications:

Number Of Cells: 6

Number of Voltages: 12

Nominal Capacity:

8hr rate 1.75Vpc @ 77°F 190

10hr rate 1.80Vpc @ 20°C 190

Nominal Dimensions:

Length: 22.1 in, 561 mm

Width: 4.90 in, 125 mm

Height: 12.4 in, 316 mm

Weight: 132 lbs, 60.0 kg

Short Circuit Current (Amps): 3800

Internal Resistance: 3.30

Electrolyte:

Volume: 2.34 gal, 8.86 L

Weight: 25.3 lbs, 11.5 kg

Features and Benefits Construction

- Capacity range 7-361Ah
- 2V, 6V and 12V monobloc configurations
- Multiple string configurations available
- Two year shelf life
- SR-4228 compliant
- Long service life
- High energy density and cycling capability
- Utilizes Thin Plate Pure Lead (TPPL) technology. Thin positive grids are produced from high purity lead from a unique manufacturing process to maximize corrosion resistance and service life while increasing energy density
- Separators are Absorbent Glass Mat (AGM) made from high purity, superior quality fibers. The electrolyte is absorbed within the AGM, preventing acid spills in case of accidental damage
- High purity electrolyte to reduce self discharge rate and float currents
- Container and cover in flame retardant UL94-V0 material, highly resistant to shock and vibration
- Front terminal batteries use tin-plated copper terminals. Top terminal batteries use a copper alloy insert
- Self-regulating one way pressure relief valves prevent air ingress

Installation and Operation

- Space efficient footprint
- Valve Regulated Lead Acid (VRLA) design reduces maintenance requirements
- Greater than 10 year life expectancy in float service at 77°F (25°C)
- TPPL technology provides increased active material surface area which yields increased energy density
- Operating temperature:
-40°F (-40°C) to 122°F (50°C)
Recommended temperature:
68°F (20°C) to 86°F (30°C)

Standards

- Approved as non-hazardous cargo for ground, sea and air transportation. Please see our SDS for complete packaging requirements at www.enersys.com
- Complies with Telcordia® SR-4228, Network Equipment Building System (NEBS™) Criteria Levels
- The management systems governing the manufacture of this product are ISO 9001:2008 and ISO 14001:2004 certified

General Specifications

Nominal Capacity					Nominal Dimensions											Electrolyte (1.300 S.G.)				Pure Acid (H2SO4)						
Battery Type	Number of Cells	Nominal Voltage (V)	8hr. Rate 1.75Vpc @ 77°F	10hr. Rate 1.80Vpc @ 20°C	Length		Width		Height		Typical Weight		Short Circuit Current (Amps)	Internal* Resistance Milli-Ohms	Terminals	Volume (per bloc)		Weight (per bloc)		Volume (per bloc)		Weight (per bloc)		Lead Weight (per bloc)		
					in	mm	in	mm	in	mm	lbs	kg				gal	L	lbs	kg	lbs	kg	lbs	kg	lbs	kg	
Form Factor 1	SBS 8	6	12	7	7	5.43	138	3.39	86.0	3.90	99.0	5.95	2.70	455	27.1	M4 F	0.10	0.38	1.08	0.49	0.03	0.11	0.43	0.19	4.26	1.93
	SBS 15	6	12	14	14	7.87	200	3.03	77.0	5.51	140	11.5	5.20	891	13.5	M6 M	0.20	0.75	2.14	0.97	0.06	0.21	0.85	0.38	7.83	3.55
	SBS 30	6	12	26	26	9.84	250	3.82	97.0	6.14	156	20.9	9.50	1556	7.90	M6 M	0.40	1.51	4.33	1.96	0.11	0.43	1.72	0.78	15.5	7.04
	HB30	6	12	26	26	9.84	250	3.82	97.0	6.14	156	21.2	9.60	1556	7.90	harness	0.40	1.51	4.33	1.96	0.11	0.43	1.72	0.78	15.5	7.04
	SBS 40	6	12	38	38	9.84	250	3.82	97.0	8.11	206	29.1	13.2	2184	5.60	M6 M	0.59	2.23	6.39	2.90	0.17	0.63	2.53	1.15	21.2	9.61
Form Factor 2	SBS 60	6	12	51	51	8.66	220	4.76	121	10.3	261	40.8	18.5	2618	4.40	M6 M	0.85	3.22	9.21	4.17	0.24	0.91	3.65	1.66	29.1	13.2
	SBS 110	3	6	116	115	7.87	200	8.19	208	9.41	239	46.7	21.2	3804	1.70	M8 M	0.95	3.60	10.3	4.67	0.27	1.01	4.08	1.85	31.6	14.3
	SBS 130	3	6	133	132	7.87	200	8.19	208	9.41	239	50.0	22.7	4111	1.40	M8 M	0.98	3.70	10.6	4.80	0.28	1.04	4.20	1.90	34.2	15.5
	SBS 300	1	2	307	310	7.87	200	8.19	208	9.41	239	47.8	21.7	8700	0.23	M8 M	0.95	3.60	10.3	4.67	0.27	1.01	4.08	1.85	31.9	14.5
Form Factor 1	SBS 390	1	2	361	360	7.87	200	8.19	208	9.41	239	51.1	23.2	11101	0.18	M8 M	0.90	3.39	9.70	4.40	0.25	0.95	3.85	1.75	34.7	15.7
	SBS J13	6	12	12	12	6.89	175	3.27	83.0	5.08	129	11.5	5.20	957	13.0	M6 F	0.18	0.68	1.95	0.88	0.05	0.19	0.77	0.35	8.11	3.68
	SBS J16	6	12	15	15	7.13	181	2.99	76.0	6.57	167	14.8	6.70	1111	11.0	M6 F	0.23	0.87	2.49	1.13	0.06	0.25	0.99	0.45	11.0	5.00
	SBS J30	6	12	26	26	6.54	166	6.89	175	4.92	125	26.0	11.8	1766	7.00	M6 F	0.39	1.48	4.22	1.92	0.11	0.42	1.68	0.76	18.1	8.19
	SBS J40	6	12	39	39	7.76	197	6.50	165	6.69	170	35.1	15.9	2400	5.20	M6 F	0.61	2.31	6.61	3.00	0.17	0.65	2.62	1.19	27.6	12.5
	SBS J70	6	12	64	64	13.0	329	6.54	166	6.85	174	60.8	27.6	3500	3.50	M6 F	0.98	3.71	10.6	4.81	0.28	1.04	4.21	1.91	44.4	20.2
	SBS J13X	6	12	12	12	7.0	177	3.37	85.6	5.17	131	11.5	5.20	957	13.0	M6 F	0.18	0.68	1.95	0.88	0.05	0.19	0.77	0.35	8.11	3.68
	SBS J16X	6	12	15	15	7.27	185	3.11	78.9	6.67	16	14.8	6.70	1111	11.0	M6 F	0.23	0.87	2.49	1.13	0.06	0.25	0.99	0.45	11.0	5.00
	SBS J30X	6	12	26	26	6.64	169	7.05	179	5.04	128	26.0	11.8	1766	7.00	M6 F	0.39	1.48	4.22	1.92	0.11	0.42	1.68	0.76	18.1	8.19
	SBS J40X	6	12	39	39	7.87	200	6.66	169	6.80	173	35.1	15.9	2400	5.20	M6 F	0.61	2.31	6.61	3.00	0.17	0.65	2.62	1.19	27.6	12.5
	SBS J70X	6	12	64	64	13.03	331	6.63	168	6.97	177	60.8	27.6	3500	3.50	M6 F	0.98	3.71	10.6	4.81	0.28	1.04	4.21	1.91	44.4	20.2
	SBS B14X	6	12	62	62	12.03	306	3.94	100	10.5	266	42.1	19.1	1800	7.00	M8 F	0.78	2.95	8.45	3.83	0.22	0.83	3.35	1.52	29.6	13.4
	Form Factor 3	SBS B8	6	12	31	31	11.0	280	3.82	97.0	6.26	159	22.7	10.3	1270	10.0	M8 F	0.37	1.42	4.05	1.84	0.11	0.40	1.61	0.73	15.6
SBS B10		6	12	38	38	11.0	280	3.82	97.0	7.24	184	26.0	11.8	1390	9.00	M8 F	0.48	1.80	5.15	2.34	0.13	0.51	2.04	0.93	17.7	8.03
SBS B14		6	12	62	62	11.0	280	3.82	97.0	10.4	264	42.1	19.1	1800	7.00	M8 F	0.78	2.95	8.45	3.83	0.22	0.83	3.35	1.52	29.6	13.4
SBS C11		6	12	91	92	15.6	395	4.13	105	10.4	264	61.7	28.0	2300	5.50	M8 F	1.28	4.85	13.9	6.29	0.36	1.36	5.50	2.49	43.3	19.7
SBS 100		6	12	100	100	15.6	395	4.25	108	11.3	287	71.9	32.6	2210	5.60	M8 F	1.34	5.09	14.6	6.60	0.38	1.43	5.77	2.62	49.7	22.6
Form Factor 4	SBS145	6	12	145	145	16.9	429	6.77	172	9.37	238	105	47.6	4100	3.00	M8 F	2.21	8.37	23.9	10.9	0.62	2.35	9.49	4.31	79.5	36.1
	SBS B8F	6	12	31	31	11.9	303	3.82	97.0	6.26	159	22.7	10.3	1270	10.0	M6 M	0.37	1.42	4.05	1.84	0.11	0.40	1.61	0.73	15.6	7.08
	SBS B10F	6	12	38	38	11.9	303	3.82	97.0	7.24	184	28.2	12.8	1390	9.00	M6 M	0.48	1.80	5.15	2.34	0.13	0.51	2.04	0.93	17.7	8.03
	SBS B14F	6	12	62	62	11.9	303	3.82	97.0	10.4	264	42.0	19.1	1800	7.00	M6 M	0.78	2.95	8.45	3.83	0.22	0.83	3.35	1.52	29.6	13.4
	SBS C11F	6	12	91	92	16.4	417	4.13	105	10.1	256	61.6	28.0	2300	5.50	M6 M	1.28	4.85	13.9	6.29	0.36	1.36	5.50	2.49	43.3	19.7
	SBS 100F	6	12	100	100	15.6	395	4.25	108	11.3	287	71.9	32.6	2210	5.60	M6 M	1.34	5.09	14.6	6.60	0.38	1.43	5.77	2.62	49.7	22.5
	SBS 112F	6	12	112	112	22.1	561	4.92	125	8.98	228	90.4	41.0	2500	5.00	M6 M	1.71	6.48	18.5	8.41	0.48	1.82	7.35	3.34	56.8	25.8
	SBS 145F	6	12	145	145	17.8	452	6.77	172	9.37	238	105	47.6	4100	3.00	M6 M	2.25	8.51	24.3	11.0	0.63	2.39	9.66	4.38	72.4	32.8
	SBS 165F	6	12	165	165	17.8	452	6.77	172	10.8	274	116	52.8	3700	2.30	M6 M	2.45	9.27	26.5	12.0	0.64	2.42	9.72	4.41	82.7	37.5
	SBS 170F	6	12	170	170	22.1	561	4.92	125	11.1	283	116	52.5	3500	3.50	M6 M	2.09	7.92	22.7	10.3	0.59	2.23	8.99	4.08	82.0	37.2
	SBS 190F	6	12	190	190	22.1	561	4.92	125	12.4	316	132	60.0	3990	3.20	M6 M	2.34	8.86	25.3	11.5	0.66	2.49	10.1	4.56	95.8	43.4

*Resistance values are for reference only and not intended to represent an Ohmic value or base line measurement

