CELLYTE 6-12 TSG GEL SERIES

6 / 12V SEALED VRLA SOLAR MONOBLOC BATTERY



SEC - 6 / 12 - TSG

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SEC Industrial Battery Co. Ltd.

Battery Profile



DESIGN LIFE

10-12 year in float service at 20°C - 30°C with Catalyst.

15Ah-235Ah at C/10 to 1.80vpc @ 25°C.

MANUFACTURED TO COMPLY

BS EN 6290 Part 4

Eurobat

UL Component approval IEC 60896 - 21 / 22- 2004

ISO 9001 : 2000 ISO 14001 : 2004

APPLICATIONS

Alternative Energy Storage
Solar Photovoltaic / Wind
Cycling / Float Service
Wheelchair / Electric vehicle
Boats/Marine/Navigational Aids
Floor Cleaning machines
Engine Starting
Water Pumping / Golf caddy
Portable medical equipment
Cathodic protection

SPECIFICATIONS

Positive electrode: Virgin Pure Lead 1.6% Tin

Negative electrode: Calcium Grid Plate Float Voltage: $2.25 \text{ vpc} \pm 1\% \text{ at } 25^{\circ}\text{C}$ Max.Charge Voltage: $2.35 \text{ vpc} \pm 1\% \text{ at } 25^{\circ}\text{C}$

Electrolyte: Sulphuric Acid thixotropic gel

Safety Valve: 1-3 PSI Self-Resealing
Post Seal: Triple Seal / barrier

Terminals: Copper Insert for Stainless Steel bolts

Container / Cover: Standard ABS or Flame Retardant V-O (optional)

INNOVATIVE FEATURES

Valve Regulated Lead Acid Quality system - ISO 9001

Gelled Thixotropic electrolyte

Spill-proof / leak proof Multi-position usage Multi-cell container Low self-discharge

FAA and IATA Approved as NON Hazardous



CAPACITY

SEC ENERGY STORAGE

Ampere Hour @ 25°C

SEC	End	DISCHA	RGE DAT	'Δ ΔΜΡς	End	DICCHARCE DATA AMBEDE HOURS -1 05 °C													
Bloc	Volts		RGE TIME		Volts														
Туре	/Cell	15MINS	_		/Cell	1hr	1.5hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	12hr	24hr	48hr	72hr	100hr
	1.80	159	102	76.2	1.85	63.0	64.6	72.5	78.5	82.4	85.4	88.2	96.8	98.3	100	113	118	122	126
6-TSG-130	1.75	173	106	78.5	1.80	64.5	68.5	76.9	83.3	87.5	90.5	93.6	102	105	107	118	122	126	130
	1.67	182	108	78.9	1.75	65.0	70.2	78.8	85.2	89.6	92.9	96.0	105	108	110	122	125	129	133
	1.80	265	170	127	1.85	105	108	121	131	137	142	147	161	164	167	188	196	203	210
6-TSG-220	1.75	288	176	131	1.80	108	114	128	139	146	151	156	171	175	179	197	204	210	217
	1.67	303	180	131	1.75	108	117	131	142	149	155	160	175	180	184	203	209	215	221
	1.80	305	196	146	1.85	121	124	139	150	158	164	169	185	188	192	216	226	234	242
6-TSG-250	1.75	331	202	151	1.80	124	131	147	160	168	174	180	197	202	205	227	234	242	250
	1.67	348	207	151	1.75	125	135	151	164	172	178	184	202	207	211	233	240	247	255
																			1
10 700 00	1.80	22.6	14.5	10.8	1.85	8.90	9.10	10.3	11.1	11.7	12.1	12.5	13.7	13.9	14.2	16.0	16.7	17.3	17.9
12-TSG-20	1.75	24.5	15.0	11.1	1.80	9.10	9.70	10.9	11.8	12.4	12.8	13.3	14.5	14.9	15.2	16.8	17.3	17.9	18.0
	1.67	25.7	15.3	11.2	1.75	9.20	9.90	11.2	12.1	12.7	13.2	13.6	14.9	15.3	15.6	17.3	17.7	18.0	18.8
	1.80	34.5	22.1	16.5	1.85	13.6	14.0	15.7	17.0	17.9	18.5	19.1	21.0	21.3	21.7	24.4	25.4	26.4	27.0
12-TSG-30	1.75	37.4	22.9	17.0	1.80	14.0	14.8	16.7	18.0	19.0	19.6	20.3	22.2	22.8	23.2	25.6	26.4	27.3	28.0
	1.67	39.3	23.4	17.1	1.75	14.1	15.2	17.1	18.5	19.4	20.1	20.8	22.8	23.4	23.9	26.4	27.1	28.0	28.8
	1.80	41.2	26.4	19.7	1.85	16.3	16.7	18.7	20.3	21.3	22.1	22.8	25.0	25.4	25.9	29.0	30.2	31.5	32.6
12-TSG-40	1.75	44.7	27.3	19.7	1.80	16.7	17.7	19.8	21.5	22.6	23.4	24.2	26.5	27.2	27.7	30.5	31.6	32.4	33.6
	1.67	46.9	27.9	20.4	1.75	16.8	18.1	20.4	22.0	23.2	24.0	24.8	27.2	27.9	28.4	31.4	32.2	33.1	34.0
	1.80	55.8	35.7	26.7	1.85	22.0	22.6	25.4	27.5	28.9	29.9	31.0	33.8	34.4	35.0	39.4	41.2	42.5	44.0
12-TSG-50	1.75	60.5	37.0	27.5	1.80	22.6	24.0	26.9	29.1	30.6	31.7	32.8	35.9	36.8	37.5	41.3	42.7	43.9	45.6
	1.67	63.6	37.8	27.6	1.75	22.7	24.6	27.6	29.9	31.4	32.5	33.6	36.8	37.8	38.5	42.6	43.7	45.2	46.0
	1.80	73.0	46.8	34.9	1.85	28.9	29.6	33.2	36.0	37.8	39.2	40.5	44.3	45.0	45.9	51.6	53.8	55.9	57.8
12-TSG-60	1.75	79.2	48.4	36.0	1.80	29.6	31.4	35.2	38.1	40.0	41.5	43.0	47.0	48.2	49.1	54.2	56.0	57.6	59.7
	1.67	83.2	49.5	36.1	1.75	29.8	32.2	36.1	39.0	41.1	42.6	44.0	48.2	49.5	50.5	55.8	57.4	59.0	60.9
	1.80	86.3	55.3	41.3	1.85	34.1	35.0	39.2	42.5	44.7	46.3	47.9	52.4	53.2	54.2	61.0	63.8	66.1	68.0
12-TSG-70	1.75	94.0	57.2	42.5	1.80	35.0	37.1	41.6	45.0	47.2	49.0	50.8	55.5	57.0	58.1	64.1	66.2	68.3	70.5
	1.67	98.0	58.5	42.7	1.75	35.2	38.0	42.7	46.2	48.4	50.3	52.1	57.0	58.5	59.6	66.0	67.7	69.8	72.0
12-TSG-80	1.80	92.9	59.5	44.4	1.85	36.7	37.7	42.3	45.8	48.0	49.8	51.6	56.5	57.3	58.4	65.7	68.6	71.2	73.6
	1.75	101	61.6	45.8	1.80	37.6	39.9	44.8	48.6	51.0	52.9	54.7	59.8	61.4	62.5	68.9	71.0	73.4	75.9
	1.67	106	63.0	46.0	1.75	37.9	41.0	46.0	49.8	52.3	54.0	56.1	61.4	63.0	64.3	71.0	73.0	75.3	77.0
	1.80	106	68.0	50.8	1.85	42.0	43.1	48.4	52.2	54.8	57.0	58.8	64.5	65.5	66.8	75.1	78.5	81.3	84.0
12-TSG-90	1.75	115	70.4	52.4	1.80	43.0	45.7	51.2	55.5	58.3	60.4	62.4	68.4	70.1	71.4	78.8	81.4	84.1	86.8
	1.67	121	71.9	52.6	1.75	43.3	46.8	52.6	56.9	59.6	61.9	64.1	70.1	72.0	73.4	81.1	83.5	86.0	88.6
	1.80	119	76.5	57.1	1.85	47.2	48.4	54.4	58.8	61.9	64.0	66.3	72.6	73.7	75.2	84.5	88.3	92.1	96.0
12-TSG-100	1.75	130	79.2	58.9	1.80	48.4	51.4	57.7	62.4	65.6	68.0	70.2	76.9	78.9	80.4	88.7	91.6	95.6	99.6
	1.67	136	80.9	59.1	1.75	48.7	52.7	59.1	63.9	67.2	69.5	72.0	78.9	81.0	82.6	91.4	94.0	97.2	101
12-TSG-110	1.80	133	85.0	63.5	1.85	52.5	53.8	60.4	65.4	68.7	71.0	73.7	80.6	81.9	83.5	93.8	97.9	102	105
12-13-110	1.75	144 151	88.0 89.9	65.5 65.7	1.80	53.8 54.1	57.1 58.5	64.1 65.7	69.3 71.1	72.8 74.7	75.5 77.4	78.0 80.1	85.5 87.7	87.7 90.0	89.3 91.8	98.6 102	102 104	105 107	108 111
	1.80	146	93.5	69.8	1.75	57.7	59.2	66.4	72.0	75.6	78.3	81.0	88.7	90.1	91.9	102	104	112	116
12-TSG-120	1.75	158	96.8	72.0	1.80	59.2	62.8	70.5	76.2	80.0	83.0	85.8	94.0	96.4	98.3	108	112	116	119
12 130-120	1.67	166	98.9	72.3	1.75	59.6	64.4	72.2	78.2	82.0	85.0	88.1	96.4	99.0	101	112	115	118	122
	1.80	159	102	76.2	1.85	63.0	64.6	72.5	78.5	82.4	85.4	88.2	96.8	98.3	109	113	118	122	126
12-TSG-130	1.75	173	106	78.5	1.80	64.5	68.5	76.9	83.3	87.5	90.5	93.6	102	105	117	118	122	126	130
	1.67	182	108	78.9	1.75	65.0	70.2	78.8	85.2	89.6	92.9	96.0	105	108	120	122	125	129	133
	1.80	181	116	86.3	1.85	71.4	73.2	82.2	89.0	93.5	96.8	100	110	111	114	128	133	138	143
12-TSG-150	1.75	196	120	89.0	1.80	73.1	77.7	87.2	94.4	99.2	103	106	116	119	121	134	138	143	148
	1.67	206	122	89.4	1.75	73.6	79.5	89.4	96.6	102	105	109	119	122	125	138	142	146	151
	1.80	202	129	96.5	1.85	79.8	81.8	91.8	99.0	104	108	112	122	124	127	143	149	155	160
12-TSG-170	1.75	219	134	99.5	1.80	81.7	86.8	97.0	105	111	115	119	130	133	136	150	155	160	166
	1.67	230	137	100	1.75	82.3	88.9	99.8	108	114	118	122	133	137	139	154	159	163	168
	1.80	227	145	109	1.85	89.7	92.0	103	112	118	122	126	138	140	143	161	168	174	180
12-TSG-190	1.75	246	150	112	1.80	92.0	97.7	110	119	125	129	134	146	150	152	168	174	180	186
	1.67	259	154	112	1.75	92.6	100	112	122	128	132	137	150	154	157	174	179	184	190
	1.80	252	162	121	1.85	99.7	102	115	124	130	135	140	153	156	158	178	186	193	200
12-TSG-210	1.75	274	167	124	1.80	102	108	122	132	138	144	149	162	167	169	187	193	200	206
	1.67	288	171	125	1.75	103	111	125	135	142	147	152	166	171	174	193	198	204	211
10 750 050	1.80	305	196	146	1.85	121	124	139	150	158	164	169	185	188	192	216	226	234	242
12-TSG-250	1.75	331	202	151	1.80	124	131	147	160	168	174	180	197	202	205	227	234	242	250
	1.67	348	207	151	1.75	125	135	151	164	172	178	184	202	207	211	233	240	248	255
10 700 000	1.80	356	228	170	1.85	141	144	162	175	184	191	197	216	219	224	252	263	273	282
12-TSG-300	1.75	386	236	175	1.80	144	153	172	186	195	202	209	229	235	239	264	273	282	291
<u> </u>	1.67	406	241	176	1.75	145	157	176	191	200	207	215	235	241	246	272	280	288	297

^{*}Actual Battery Discharge Data may be $\pm\,5\%$ of figures shown.

CURRENT Amps @ 25°C



Sec	_																				
Type													SCHARGE DATA AMPS at 25°C								
		Bloc		DISCHA									DISCH	IARGE T	IME IN I	IOURS					
4-15G-130	L	Type	-				•														
1.67 1.62 1.08 7.89 1.75 1.55 1.65 1.64 3.94 3.94 2.84 2.24 1.64 1.65 1.31 1.08 1.77 5.08 2.60 7.79 1.35 1.65 1.65 1.35 1.05 7.18 1.65 1.05 7.18 7.18 1.05 7.18																					
1-15-2-20		6-15G-130																			
6-18G220 1.75 2.888 1.75 1.31 1.180 1.30 1.75 1.75 1.80 1.40	L																				
1.67 2030 180 131 1.75 108 780 6.55 7.3 37.3 31.0 26.7 21.7 18.0 15.3 4.44 435 2.79 22.1		4-TSG-220																			
180 395 198 146 1,85 121 82.5 87.5 89.0 39.5 33.8 28.2 23.1 18.8 10.0 70.0 47.0 32.5 24.5 22.5 17.5 331 20.2 151 17.5 131 89.7 73.5 53.2 41.7 34.7 34.5 22.0 17.6 0.7 0.4 4.88 33.8 32.6 22.0 17.6 0.7 0.4 4.88 33.8 32.6 22.0 17.6 0.7 0.4 4.88 33.8 24.6 0.4 22.5 17.5 0.0 34.8 22.5 17.5 0.0 34.8 22.5 17.5 0.0 34.8 22.5 17.5 0.0 34.8 22.5 17.5 0.0 34.8 22.5 17.5 31.2 17.5 31.5		0-13G-220																			
A-19C-260 1,78 331 302 151 1,80 124 87.3 73.5 83.2 41.9 34.7 30.0 24.6 20.2 17.1 74.4 48.8 33.8 23.0 23.0 24.7 24.7 24.8 24.7 27.1 24.8	F																				
1.15G-20	AL.	6-TSG-250																			
12-15G-20																					
12-15G-20	Ξ					*		8													-
1.67 25.7 15.3 11.2 1.75 7.20 6.60 5.00 3.01 2.43 2.27 1.85 1.33 1.30 0.77 0.37 0.25 0.19																					
1.80		12-TSG-20																			
1.75 37.4 22.9 17.0 18.0 14.0 9.87 8.34 4.00 4.74 3.72 3.38 2.78 2.28 3.34 17.1 0.55 0.38 0.28 12.75 14.7 3.23 3.34 17.1 17.5 14.1 10.1 8.54 10.1 8.54 11.1 4.55 4.02 3.47 2.25 2.34 17.9 11.0 0.55 0.38 0.28 17.75 14.7 2.73 20.3 18.0 16.7 11.8 7.90 7.17 5.65 4.84 4.03 3.31 2.54 2.23 17.7 0.65 0.44 0.33 17.75 14.7 2.73 20.3 18.0 16.7 11.8 7.90 7.17 5.65 4.84 4.03 3.31 2.72 2.31 12.7 0.65 0.45 0.34 0.35	L																				
1.67 39.3 23.4 17.1 17.5 14.1 10.1 8.54 6.16 4.85 4.02 3.47 2.85 2.34 17.1 0.55 0.39 0.29 12.75G-40 1.75 44.7 27.3 20.3 1.80 16.7 11.8 9.90 7.17 5.55 4.48 4.03 3.31 2.72 2.37 3.31 1.27 0.64 0.45 0.34 1.27 1.	71	10 TCC 20																			
1.80		12-13G-30																			
1.75 44.7 27.3 20.3 1.80 16.7 11.8 9.90 7.17 5.65 4.88 4.03 3.31 2.72 2.31 1.27 0.66 0.45 0.34 1.47 46.9 27.9 20.4 1.75 1.68 22.0 1.51 1.27 7.16 7.22 5.78 5.16 4.23 3.44 2.72 1.44 0.86 0.59 0.44 1.80 56.8 35.7 26.7 1.86 22.0 1.0 13.5 7.70 7.56 5.43 5.47 4.23 3.44 2.72 1.44 0.86 0.59 0.44 1.67 53.0 37.6 27.5 1.80 22.4 1.60 13.5 7.70 7.56 5.43 5.47 4.62 3.34 2.72 1.75 0.65 0.10 1.67 53.0 37.6 27.5 1.80 22.4 1.60 13.5 7.70 7.56 5.43 5.47 4.62 3.34 2.72 0.75 1.04 0.86 1.67 53.0 37.6 27.5 1.80 22.4 1.60 13.5 7.70 7.56 5.43 5.47 4.60 3.78 3.21 1.75 0.91 0.48 0.85 1.21 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.21 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.21 1.25																					
1.67		12-TSG-40																			
1.80 55.8 35.7 26.7 1.85 22.0 15.1 12.7 7.16 7.22 5.78 5.16 4.23 3.44 2.92 1.64 0.86 0.59 0.044 1.75 0.65 0.370 27.5 1.80 22.0 1.61 1.85 7.70 7.65 6.34 5.47 4.73 3.86 3.13 72 0.89 0.04 0.46 0.46 1.47 43.6 37.8 27.8 1.75 22.7 16.4 13.8 10.0 7.84 6.50 5.00 4.00 3.78 3.21 1.78 0.79 0.63 0.46 1.75 7.70 48.4 3.60 1.80 27.6 1.76 1.20 7.61 1.20 7.67 3.81 7.55 4.50 3.83 3.13 15 112 7.78 0.53 0.46 1.75 7.72 48.4 3.60 1.80 27.6 27.7 1.60 1.20 7.67 3.85 7.38 4.75 5.45 4.50 3.83 3.13 1.75 27.8 0.20 1.75 7.72 48.4 3.60 1.80 27.6 20.7 17.6 1.20 1.00 8.30 7.17 5.88 4.82 4.09 2.25 1.17 0.08 0.08 1.20 1.75 7.70 1.80 1.80 1.75 27.8 27.8 27.																					
1.75 1.67 6.0.5 37.0 27.5 1.80 22.6 1.60 13.5 7.07 7.65 6.34 5.47 4.49 3.48 3.13 1.72 0.89 0.61 0.45	r																				
1.67 63.6 37.8 27.6 1.75 22.7 16.4 13.8 10.0 7.84 6.50 5.60 4.60 3.78 3.21 1.78 0.79 0.63 0.46 1.75 1.75 22.7 16.4 13.8 10.0 7.84 6.50 5.60 4.60 3.78 3.21 1.72 0.78 0.58 1.75		12-TSG-50							16.0												
1.75 79.2 48.4 36.0 1.80 29.6 20.9 17.6 12.7 10.0 8.30 7.17 5.88 48.2 40.9 2.26 1.17 0.80 0.60 1.67 83.2 49.5 36.1 1.75 27.8 21.5 18.1 13.0 10.3 8.51 7.75 4.55 5.32 4.52 2.54 1.33 1.00 0.80 1.80 86.3 55.3 41.3 1.85 34.1 23.3 19.6 14.2 11.2 9.26 7.98 6.55 5.32 4.52 2.54 1.33 0.92 0.68 1.67 80.0 86.5 42.7 1.75 35.2 25.3 21.4 15.4 12.1 10.1 8.68 7.12 5.85 4.77 2.75 1.41 0.97 0.72 1.80 79.2 95.5 44.4 1.85 36.7 25.1 21.2 15.3 20.0 10.0 8.68 7.12 5.85 4.77 2.75 1.41 0.97 0.72 1.80 1.67 10.1 61.6 45.8 1.80 37.6 22.6 22.4 16.2 12.8 10.6 9.12 7.48 61.4 5.21 2.87 1.48 10.2 0.76 1.67 1.67 10.6 63.0 46.0 1.75 37.7 27.3 23.0 16.6 13.1 10.8 7.67 63.0 5.36 2.67 1.85 0.76 1.80 10.6 68.0 50.8 18.5 42.0 28.7 24.2 17.4 13.7 11.4 9.80 8.06 6.55 5.77 31.3 1.44 11.3 0.84 1.81 1.80	L				37.8	27.6	1.75	22.7		13.8	10.0						3.21		0.91	0.63	
1.67 83.2 44.5 36.1 1.75 27.8 21.5 18.1 13.0 10.3 8.51 7.34 6.03 4.75 4.21 2.33 1.20 0.82 0.81																					
1.80		12-TSG-60																			
12-TSG-70 1.75 94.0 57.2 42.5 1.80 35.0 24.7 20.8 15.0 11.8 9.80 8.47 8.76 4.84 2.67 1.38 0.95 0.77 1.1 1.97 0.72 1.1 1.07 0.05 0.05 1.1 1.0	ŀ																				
1.67 98.0 58.5 42.7 1.75 35.2 25.3 21.4 15.4 12.1 10.1 8.68 71.2 8.85 4.97 7.75 1.41 0.97 0.72 1.27 1.57 101 61.6 43.8 1.80 37.6 26.6 22.4 16.2 12.8 10.6 71.2 71.8 71.4 1.0 79 0.74 1.57 101 61.6 43.0 44.0 1.75 37.9 27.3 32.0 16.6 13.1 10.6 71.2 71.8 51.6 51.7 71.8 51.0 50 7.7 1.60 106 63.0 64.0 50.8 1.85 42.0 28.7 24.2 17.4 13.7 11.4 9.80 80.6 5.55 5.7 3.13 1.4 1.13 0.84 1.15 1.75 115 70.4 52.4 1.80 43.0 30.5 25.6 18.5 14.6 12.1 10.4 8.55 701 5.95 3.28 1.70 1.17 0.87 1.67 121 71.9 52.6 1.75 43.3 31.2 26.3 17.0 14.7 12.1 10.4 8.55 701 5.95 3.28 1.70 1.17 0.87 1.80 119 7.5 55.9 1.80 44.2 32.3 27.2 19.6 15.2 1.8 11.7 0.7 7.37 27.3 21.8 1.24 1.28 1.27 1.75 130 79.2 58.9 1.80 48.4 34.3 28.9 20.8 16.4 31.6 11.7 7.8 7.89 6.70 3.70 1.91 1.33 1.00 1.67 1.36 80.9 59.1 1.75 48.7 35.1 29.6 21.3 1.88 13.9 12.0 9.86 8.10 6.88 3.81 1.76 1.35 1.00 1.67 1.57 1.44 88.0 65.5 1.85 52.5 35.9 30.2 21.8 17.2 14.2 3.01 81.9 6.8 3.8 3.1 1.76 1.35 1.00 1.67 1.57 1.58 9.8 65.7 1.75 54.1 39.0 32.9 20.8 18.9 15.5 13.4 11.0 9.0 7.66 42.9 2.1 1.46 1.05 1.27 1.57 1.58 9.8 8.5 7.7 37.5 54.1 39.0 32.9 20.8 18.9 15.7 15.5 13.4 11.0 9.0 7.66 42.9 2.1 1.46 1.05 1.27 1.57 1.58 9.8 8.5 7.7 37.5 54.1 39.0 32.9 37.8 18.7 15.5 13.4 11.0 90.7 7.64 42.9 2.5 1.55 1.16 1.27 1.58 9.8 65.7 1.75 54.1 39.0 32.9 20.8 18.7 1.5 13.4 11.0 90.7 7.64 42.9 2.5 1.55 1.16 1.27 1.57 1.58 9.8 8.5 8.5 8.57 39.5 30.2 21.8 17.2 14.5 11.0 11.0 90.7 7.64 42.9 2.5 1.55 1		10 700 70																			
1.80 72.9 79.5 44.4 1.85 36.7 25.1 21.2 15.3 12.0 10.0 8.60 7.06 5.73 4.87 7.74 1.43 0.99 0.74 1.75 101 61.6 48.8 1.80 37.6 26.6 22.4 16.6 12.8 10.6 3.5 7.76 7.48 1.48 20.2 0.76 1.76 1.77 106 63.0 46.0 1.75 37.9 27.3 23.0 16.6 13.1 10.8 0.35 7.67 5.30 5.36 2.76 1.88 10.2 0.76 1.80 106 68.0 50.8 1.85 42.0 28.7 24.2 17.4 13.7 11.4 7.80 8.06 6.55 5.57 3.13 1.64 1.13 0.84 1.75 115 70.4 52.4 1.80 43.0 30.5 25.6 18.5 14.6 12.1 10.4 6.55 7.0 5.75 3.28 1.70 1.17 0.87 1.80 119 76.5 57.1 1.85 47.2 32.3 31.2 26.3 19.0 14.9 12.4 10.7 6.75 7.0 5.75 3.28 1.70 1.17 0.87 1.80 119 76.5 57.1 1.85 47.2 32.3 37.2 17.6 1.55 12.8 11.1 9.07 7.37 6.27 3.52 1.84 1.28 0.96 1.75 130 79.2 58.9 1.80 48.4 34.3 28.9 20.8 16.4 13.6 11.7 9.1 7.07 7.37 6.27 3.52 1.84 1.28 0.96 1.80 133 85.0 63.5 1.85 52.5 35.7 30.2 21.8 17.2 14.2 12.3 10.1 8.19 6.76 3.91 2.04 1.41 1.05 1.80 133 85.0 63.5 1.85 57.3 53.1 27.6 21.8 17.2 14.2 12.3 10.1 8.19 6.76 3.91 2.04 1.41 1.05 1.80 1.40		12-13G-70																			
12-TSG-90	H																				
1.87		12-TSG-80																			
1.80																					
12-TSG-10	r	12-TSG-90																			
1.67 121 71.9 52.6 1.75 43.3 31.2 28.3 19.0 14.9 12.4 10.7 8.76 7.20 6.12 3.38 1.74 1.19 0.89																					
12-TSG-100																		_			
1.75 130 79.2 58.9 1.80 48.4 34.3 28.9 20.8 16.4 13.6 11.7 9.61 7.89 6.70 3.70 1.91 1.33 1.00	H																				
1.67 136 80.9 59.1 1.75 48.7 35.1 29.6 21.3 16.8 13.9 12.0 9.86 8.10 6.88 3.81 1.96 1.35 1.01		12-TSG-100																_			
1.80		12 100 100																			
12-TSG-110	H																				
1.67 151 89.9 65.7 1.75 54.1 39.0 32.9 23.7 18.7 15.5 13.4 11.0 9.00 7.65 4.23 2.17 1.49 1.11		12 TSC 110						_								-		_			-
180		12-13G-110																_			
12-TSG-120	H							_								-		_			-
1.67 1.66 98.9 72.3 1.75 59.6 42.9 36.1 26.1 20.5 17.0 14.7 12.1 9.90 8.42 4.65 2.39 1.64 1.22																					
12-TSG-130		12-15G-120																		_	
12-TSG-130	L																	_			
1.67 182 108 78.9 1.75 65.0 46.8 39.4 28.4 22.4 18.6 16.0 13.1 10.8 10.0 5.08 2.60 1.79 1.33 1.80 181 116 86.3 1.85 71.4 48.8 41.1 29.7 23.4 19.4 16.7 13.7 11.1 9.5 5.32 2.77 1.92 1.43 1.75 196 120 89.0 1.80 73.1 51.8 43.6 31.5 24.8 20.5 17.7 14.5 11.9 10.1 5.58 2.88 1.99 1.48 1.67 206 122 89.4 1.75 73.6 53.0 44.7 32.2 25.4 21.0 18.2 14.9 12.2 10.4 5.75 2.96 2.03 15.1 1.80 202 129 96.5 1.85 79.8 54.5 45.9 33.0 26.0 21.6 18.7 15.3 11.3 6.24 3.22 2.22 1.66 1.67 230 137 100 1.75 82.3 57.3 49.9 36.0 28.4 23.5 20.3 16.6 13.7 11.6 6.42 3.31 2.26 1.68 1.80 227 145 109 1.85 89.7 61.3 51.5 37.3 29.4 24.4 21.0 17.2 14.0 11.9 6.69 3.50 2.42 1.80 1.67 230 237 145 109 1.85 89.7 61.3 51.5 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 1.67 288 171 125 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 1.67 348 207 151 1.80 124 87.3 73.5 53.2 41.9 34.7 30.0 24.6 20.2 17.6 9.71 5.00 3.44 2.55 1.67 348 207 151 1.75 125 87.7 75.5 54.5 43.0 38.2 32.8 27.0 21.9 18.7 10.5 54.8 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 14								_													
1.80	1	12-TSG-130																_			
12-ISG-150	L																				
1.67 206 122 89.4 1.75 73.6 53.0 44.7 32.2 25.4 21.0 18.2 14.9 12.2 10.4 5.75 2.96 2.03 1.51			1.80	181	116	86.3	1.85	71.4	48.8	41.1	29.7	23.4	19.4	16.7	13.7	11.1	9.5	5.32	2.77	1.92	1.43
1.80 202 129 96.5 1.85 79.8 54.5 45.9 33.0 26.0 21.6 18.7 15.3 12.4 10.6 5.95 3.10 2.15 1.60 1.75 219 134 99.5 1.80 81.7 57.9 48.5 35.0 27.7 23.0 19.8 16.2 13.3 11.3 6.24 3.22 2.22 1.66 1.67 230 137 100 1.75 82.3 59.3 49.9 36.0 28.4 23.5 20.3 16.6 13.7 11.6 6.42 3.31 2.26 1.68 1.80 227 145 109 1.85 89.7 61.3 51.5 37.3 29.4 24.4 21.0 17.2 14.0 11.9 6.69 3.50 2.42 1.80 1.75 246 150 112 1.80 92.0 65.1 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 12-TSG-210 1.80 252 162 121 1.85 99.7 68.0 57.4 41.3 32.6 27.0 23.3 19.1 15.6 13.2 7.42 3.88 2.68 2.00 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 12-TSG-250 1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11		12-TSG-150	1.75	196	120	89.0	1.80	73.1	51.8	43.6	31.5	24.8	20.5	17.7	14.5	11.9	10.1	5.58	2.88	1.99	1.48
12-TSG-170 1.75 219 134 99.5 1.80 81.7 57.9 48.5 35.0 27.7 23.0 19.8 16.2 13.3 11.3 6.24 3.22 2.22 1.66 1.67 230 137 100 1.75 82.3 59.3 49.9 36.0 28.4 23.5 20.3 16.6 13.7 11.6 6.42 3.31 2.26 1.68 1.80 227 145 109 1.85 89.7 61.3 51.5 37.3 29.4 24.4 21.0 17.2 14.0 11.9 6.69 3.50 2.42 1.80 1.75 246 150 112 1.80 92.0 65.1 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 12-TSG-210 1.75 274 167 124 1.80 102 72.0 60.9 43.9 43.6 24.8 24.8 24.8 24.8 24.8 24.8 25.8 26.8 17.1 14.5 14.1 14.5 18.0			1.67	206	122	89.4	1.75	73.6	53.0	44.7	32.2	25.4	21.0	18.2	14.9	12.2	10.4	5.75	2.96	2.03	1.51
1.67 230 137 100 1.75 82.3 59.3 49.9 36.0 28.4 23.5 20.3 16.6 13.7 11.6 6.42 3.31 2.26 1.68	Γ		1.80	202	129	96.5	1.85	79.8	54.5	45.9	33.0	26.0	21.6	18.7	15.3	12.4	10.6	5.95	3.10	2.15	1.60
1.80 227 145 109 1.85 89.7 61.3 51.5 37.3 29.4 24.4 21.0 17.2 14.0 11.9 6.69 3.50 2.42 1.80 1.75 246 150 112 1.80 92.0 65.1 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 1.81 1.80 252 162 121 1.85 99.7 68.0 57.4 41.3 32.6 27.0 23.3 19.1 15.6 13.2 7.42 3.88 2.68 2.00 1.75 274 167 124 1.80 102 72.0 60.9 43.9 34.6 28.7 24.8 20.3 16.7 14.1 7.79 4.02 2.78 2.06 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 1.85 121 82.5 69.5 50.0 39.5 32.8 28.2 23.1 18.8 16.0 9.00 4.70 3.25 2.42 1.75 331 202 151 1.80 124 87.3 73.5 53.2 41.9 34.7 30.0 24.6 20.2 17.1 9.44 4.88 3.36 2.50 1.86 1.67 348 207 151 1.75 125 89.7 75.5 54.5 43.0 35.6 30.7 25.2 20.7 17.6 9.71 5.00 3.44 2.55 1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.79 2.82 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91	1	12-TSG-170	1.75	219	134	99.5	1.80	81.7	57.9	48.5	35.0	27.7	23.0	19.8	16.2	13.3	11.3	6.24	3.22	2.22	1.66
1.80 227 145 109 1.85 89.7 61.3 51.5 37.3 29.4 24.4 21.0 17.2 14.0 11.9 6.69 3.50 2.42 1.80 1.75 246 150 112 1.80 92.0 65.1 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 1.81 1.80 252 162 121 1.85 99.7 68.0 57.4 41.3 32.6 27.0 23.3 19.1 15.6 13.2 7.42 3.88 2.68 2.00 1.75 274 167 124 1.80 102 72.0 60.9 43.9 34.6 28.7 24.8 20.3 16.7 14.1 7.79 4.02 2.78 2.06 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 1.85 121 82.5 69.5 50.0 39.5 32.8 28.2 23.1 18.8 16.0 9.00 4.70 3.25 2.42 1.75 331 202 151 1.80 124 87.3 73.5 53.2 41.9 34.7 30.0 24.6 20.2 17.1 9.44 4.88 3.36 2.50 1.86 1.67 348 207 151 1.75 125 89.7 75.5 54.5 43.0 35.6 30.7 25.2 20.7 17.6 9.71 5.00 3.44 2.55 1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.79 2.82 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91	1											_									
12-TSG-190 1.75 246 150 112 1.80 92.0 65.1 54.8 39.6 31.2 25.8 22.3 18.3 15.0 12.7 7.02 3.63 2.50 1.86 1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90 12-TSG-210 1.75 274 167 124 1.80 102 72.0 60.9 40.5																					
1.67 259 154 112 1.75 92.6 66.7 56.0 40.5 31.9 26.4 22.8 18.7 15.4 13.1 7.23 3.72 2.56 1.90		12-TSG-190																			
1.80			_						_							-				_	
12-TSG-210 1.75 274 167 124 1.80 102 72.0 60.9 43.9 34.6 28.7 24.8 20.3 16.7 14.1 7.79 4.02 2.78 2.06 1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 180 305 196 146 1.85 121 82.5 69.5 50.0 39.5 32.8 28.2 23.1 18.8 16.0 9.00 4.70 3.25 2.42 1.75 331 202 151 1.80 124 87.3 73.5 53.2 41.9 34.7 30.0 24.6 20.2 17.1 9.44 4.88 3.36 2.50 1.67 348 207 151 1.75 125 89.7 75.5 54.5 43.0 35.6 30.7 25.2 20.7 17.6 9.71 5.00 3.44 2.55 180 35.6 288 170 1.85 180 35.6 288 170 1.85 180 180 35.6 288 170 1.85 180 180 180 180 180 180 180 1	F																	_			
1.67 288 171 125 1.75 103 74.0 62.4 45.0 35.5 29.4 25.3 20.8 17.1 14.5 8.04 4.13 2.84 2.11 1.80 305 196 146 1.85 121 82.5 69.5 50.0 39.5 32.8 28.2 23.1 18.8 16.0 9.00 4.70 3.25 2.42 12-TSG-250 1.75 331 202 151 1.80 124 87.3 73.5 53.2 41.9 34.7 30.0 24.6 20.2 17.1 9.44 4.88 3.36 2.50 1.67 348 207 151 1.75 125 89.7 75.5 54.5 43.0 35.6 30.7 25.2 20.7 17.6 9.71 5.00 3.44 2.55 1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.79 2.82 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91	1	12-TSG-210														-		_			-
12-TSG-250	1	12-15G-210																_			
12-TSG-250	F																				
1.67 348 207 151 1.75 125 89.7 75.5 54.5 43.0 35.6 30.7 25.2 20.7 17.6 9.71 5.00 3.44 2.55 1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.79 2.82 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91		10 TCC 050																_			
1.80 356 228 170 1.85 141 96.0 81.0 58.3 46.0 38.2 32.8 27.0 21.9 18.7 10.5 5.48 3.79 2.82 12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91		12-13G-250														-				_	-
12-TSG-300 1.75 386 236 175 1.80 144 102 85.9 62.0 48.8 40.4 34.9 28.6 23.5 19.9 11.0 5.68 3.92 2.91	L																				
	1																				
1.67 406 241 176 1.75 145 105 88.0 63.5 50.0 41.4 35.8 29.4 24.1 20.5 11.3 5.83 4.00 2.97	1	12-TSG-300																			
		1.67	406	241	176	1.75	145	105	88.0	63.5	50.0	41.4	35.8	29.4	24.1	20.5	11.3	5.83	4.00	2.97	

^{*}Actual Battery Discharge Data may be $\pm\,5\%$ of figures shown.

POWER





	SEC	End	DISCHAR	GE DATA W	ATTS/CELL	End	DISCHARGE DATA WATTS/CELL at 25°C													
14-16-19 14-1	Bloc	Volts	DISCHA	ARGE TIME	IN MINS	Volts	DISCHARGE TIME IN HOURS													
-156-190 1.75	Туре	/Cell	15MINS	30MINS	45MINS	/Cell	1hr	1.5hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	12hr	24hr	48	72	100
14 15 16 16 16 17 18 18 18 18 18 18 18		1.80	294	191	143	1.85	121	82.9	70.1	51.0	40.4	33.6	29.1	24.0	19.6	16.7	9.41	4.92	3.39	2.57
Heat	6-TSG-130	1.75	311	193	145	1.80	122	87.2	73.8	53.8	42.7	35.5	30.7	25.3	20.8	17.7	9.83	5.08	3.50	2.64
1.15 1.15		1.67	319	194	144	1.75	121	88.2	74.8	54.5	43.3	36.1	31.2	25.7	21.3	18.1	10.1	5.17	3.55	2.70
1.15 1.15		1.80	490	319	239	1.85	201	138	117	85.0	67.2	55.9	48.4	40.0	32.7	27.8	15.7	8.20	5.66	4.28
14 15 15 15 15 15 15 15	6-TSG-220													_						_
14-15-240 1-15														_	_					_
														_						_
14	4-TSG-250									_							_			
1-18 1-18	0-130-230						_							_				_		
14-15		1.07	007	3/3	2/0	1./3	233	107	143	103	63. I	07.1	37.6	47.4	40.7	34.7	17.3	7.73	0.01	3.16
14-15		1.00	41.0	07.0	00.0	1.05	17.0	11.7	0.04	7.01	C 72	4 77	4 10	2.40	0.77	0.07	124	0.70	0.40	0.27
14	10 700 00																			_
12-15(-9-10) 18-06 18-08	12-15G-20		1																	
1.1 1.2				27.5			17.2			7.73	6.12		4.42	3.65		2.56		0.73	0.50	0.38
12-15G-40 14-7		1.80	63.8	41.5	31.1	1.85	26.0	18.0	15.2	11.0	8.77	7.29	6.31	5.21	4.25	3.61	2.04	1.06	0.74	0.55
180 74.2 49.6 37.1 18.8 31.2 21.4 18.1 13.2 10.4 8.9" 75.1 6.2 5.06 6.3 2.4 12.6 10.8 0.46 12.7	12-TSG-30	1.75	67.3	41.8	31.4	1.80	26.5	18.8	16.0	11.6	9.24	7.68	6.65	5.49	4.52	3.85	2.13	1.10	0.76	0.57
12-15G-40 1.76 80.5 49.8 37.5 18.0 31.6 22.5 19.0 13.9 11.0 17.7 79.8 4.5 5.0 15.9 2.5 13.8 13.0 0.6		1.67	68.8	42.1	31.3	1.75	26.3	19.0	16.2	11.8	9.37	7.81	6.76	5.59	4.61	3.93	2.18	1.12	0.77	0.58
12-15G-40 1.75		1.80	76.2	49.6	37.1	1.85	31.2	21.4	18.1	13.2	10.4	8.69	7.51	6.21	5.06	4.31	2.43	1.26	0.88	0.66
147 148 148 149	12-TSG-40																			
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1.75 143 88.3 64.4 180 55.1 39.7 33.8 24.6 19.5 16.3 14.1 11.6 15.6 56.1 14.5 12.5 2.3 1.0 12.1 1.80 180 194 77.7 1.85 55.2 4.6 37.9 27.8 21.9 18.2 18.8 13.0 10.6 70.4 51.0 2.57 1.84 1.39 1.81 1.75 187 104 77.7 1.85 55.2 4.6 37.9 27.8 21.9 18.2 18.8 13.0 10.6 70.4 51.0 2.57 1.84 1.39 1.75 187 104 77.7 1.85 65.2 47.8 37.9 27.8 21.9 18.2 18.8 13.0 10.6 70.4 51.0 2.57 1.84 1.39 1.80 172 112 83.4 18.5 70.2 83.3 80.5 27.5 23.4 19.5 16.4 13.7 11.3 74.3 2.54 2.7 1.7 1.8 1.80 172 112 83.4 18.5 70.2 83.3 80.9 27.8 23.5 19.5 14.0 11.5 78.8 54.6 2.8 1.8 1.8 1.57 182 112 84.5 18.0 71.2 50.8 30.3 32.4 48.5 31.0 31.4 24.9 20.7 17.5 14.0 11.5 57.8 58.8 30.2 20.8 15.6 1.57 186 113 84.2 17.5 70.7 51.5 43.7 31.8 23.3 10.1 12.4 10.4 57.4 57.4 2.4 10.1 1.58 1.59 1.59 1.59 1.50 3.5										_		_					_			
1.67																				_
1.80	12-TSG-60	1.75	143	88.3	66.4	1.80	56.1	39.9	33.8	24.6	19.5	16.3	14.1	11.6	9.56	8.14	4.52	2.33	1.60	1.21
1.75		1.67	146	89.1	66.1	1.75	55.6	40.5	34.3	24.9	19.9	16.5	14.3	11.8	9.74	8.30	4.62	2.37	1.63	1.24
1.67 172 105 78.1 1.75 65.4 47.8 40.5 27.5 23.4 17.5 14.0 14.0 11.5 9.8 5.4 2.80 1.73 11.5 1.80		1.80	160	104	77.7	1.85	65.2	44.8	37.9	27.6	21.9	18.2	15.8	13.0	10.6	9.04	5.10	2.67	1.84	1.39
1.1 1.1 1.2	12-TSG-70	1.75	169	104	78.4	1.80	66.3	47.2	39.9	29.1	23.0	19.2	16.6	13.7	11.3	9.63	5.34	2.76	1.90	1.43
1.1 1.1 1.2		1.67	172	105	78.1	1.75	65.6	47.8	40.5	29.5	23.4	19.5	16.9	14.0	11.5	9.81	5.46	2.80	1.93	1.46
12-ISG-180 1.67 186													_							
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1.67 212 129 76.3 1.75 80.8 58.8 49.9 36.4 28.8 24.0 20.8 17.2 14.2 12.1 6.71 3.45 2.37 1.80 1.27 1.57 2.34 145 107 1.80 97.3 62.1 52.6 38.2 30.4 25.2 21.8 18.0 14.7 12.5 7.06 3.75 2.57 2.50 1.75 2.34 145 109 1.80 17.5 90.8 62.2 52.6 38.2 30.4 25.2 21.8 18.0 14.7 12.5 7.06 3.75 3.9 2.56 2.03 1.76 2.38 146 108 1.75 90.8 62.2 56.1 40.9 32.5 27.0 23.4 19.3 15.9 13.6 7.56 3.89 2.66 2.03 1.80 246 160 120 1.85 100 67.0 58.4 42.5 3.7 28.0 24.3 20.0 16.3 13.9 7.85 4.09 2.83 2.14 1.75 259 161 121 1.80 102 72.7 61.5 44.7 35.5 27.6 25.6 21.1 17.4 14.8 8.22 42.4 2.92 2.20 1.27 1.47 24.4 162 120 1.75 101 73.5 62.3 45.5 3.7 3.09 26.0 21.5 17.7 15.1 8.0 4.02 2.24 1.27 1.27 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.27 1.27 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28 1.28	10 75 0 00									_		_					_			_
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12-TSG-110 1.80 246 160 120 1.85 100 69.0 58.4 42.5 33.7 28.0 24.3 20.0 16.3 13.7 7.85 4.07 2.83 2.14 12-TSG-120 1.67 224 162 120 1.75 101 73.5 62.3 45.5 3.81 30.1 24.0 21.5 17.7 15.1 8.40 43.0 2.95 2.20 12-TSG-120 1.80 270 175 131 1.85 110 75.7 64.2 46.8 37.1 30.7 28.7 22.0 18.0 15.3 8.61 4.52 3.11 2.36 12-TSG-120 1.80 270 178 132 1.80 112 79.7 67.7 49.2 39.0 39.5 28.1 23.2 19.1 16.3 90.0 4.66 3.22 2.42 12-TSG-130 1.80 294 191 143 1.85 121 82.7 70.1 51.0 40.4 33.6 29.1 24.0 19.5 16.6 9.23 47.5 3.25 2.42 12-TSG-130 1.80 294 191 143 1.85 121 82.7 70.1 51.0 40.4 33.5 29.1 24.0 19.6 18.2 9.41 49.2 3.39 2.57 12-TSG-130 1.80 335 218 142 1.85 137 93.7 74.8 54.5 53.8 42.7 35.5 30.7 25.3 20.8 19.4 9.83 50.8 3.50 2.64 12-TSG-140 1.80 335 218 162 1.85 137 93.7 79.4 57.8 45.9 38.1 30.0 27.2 22.1 18.9 10.7 5.56 3.85 2.91 12-TSG-150 1.57 336 219 144 1.85 153 105 88.7 64.3 64.0 42.5 34.7 32.0 24.0	12-TSG-100																			
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12-ISG-120		1.67	264	162	120	1.75	101	73.5	62.3	45.5	36.1	30.1	26.0	21.5	17.7	15.1	8.40	4.30	2.96	2.25
1.67 291 178 132 1.75 111 80.9 68.5 50.0 39.6 33.0 28.6 23.6 19.5 16.6 9.23 4.75 3.25 2.48 1.80 294 191 143 1.85 121 82.9 70.1 51.0 40.4 33.6 29.1 24.0 19.6 18.2 9.41 4.92 3.39 2.57 1.67 319 194 144 1.75 121 82.9 70.1 51.0 40.4 33.6 29.1 24.0 19.6 18.2 9.41 4.92 3.39 2.57 1.67 319 194 144 1.75 121 82.9 70.1 51.0 40.4 33.6 29.1 24.0 19.6 18.2 9.41 4.92 3.39 2.57 1.80 335 218 162 1.85 137 93.9 79.4 57.8 45.9 38.1 33.0 27.2 21.1 19.7 10.1 5.17 3.55 2.70 1.75 353 219 164 1.80 138 98.9 83.7 61.0 48.4 40.2 34.7 28.7 23.6 20.1 11.2 5.75 3.97 3.01 1.67 361 220 164 1.75 137 97.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.80 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.81 1.80 374 242 183 1.75 153 112 94.7 67.0 54.0 45.6 39.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 1.81 1.80 40.0 272 20.5 1.85 172 118 99.5 77.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 70.2 4.85 3.67 1.85 443 274 207 1.80 174 124 105 76.7 60.8 50.5 43.8 36.1 29.8 25.3 14.0 7.25 5.00 3.78 1.81 1.80 46.6 30.4 228 1.85 191 131 111 80.6 64.0 53.2 46.1 38.0 31.1 26.4 14.9 7.78 5.38 4.07 1.85 596 349 279 1.80 235 167 141 103 81.7 68.0 59.0 48.6 40.0 33.7 28.6 16.0 81.9 5.64 4.28 1.81 1.80 659 428 320 1.85 270 185 175 175 175 185 175 175 175 185		1.80	270	175	131	1.85	110	75.9	64.2	46.8	37.1	30.9	26.7	22.0	18.0	15.3	8.61	4.52	3.11	2.36
1.80 294 191 143 1.85 121 82.9 70.1 51.0 40.4 33.6 29.1 24.0 19.6 18.2 9.41 4.92 3.39 2.57 1.75 311 193 145 1.80 122 87.2 73.8 53.8 42.7 35.5 30.7 25.3 20.8 19.4 9.83 5.08 3.50 2.64 1.67 319 194 144 1.75 121 88.2 74.8 54.5 43.3 36.1 31.2 25.7 21.3 19.7 10.1 51.7 3.55 2.70 1.80 335 218 162 1.85 137 93.9 79.4 57.8 45.9 38.1 33.0 27.2 22.1 18.9 10.7 5.56 3.85 2.91 1.57 353 219 164 1.80 138 98.9 83.7 61.0 48.4 40.2 34.7 28.7 23.6 20.1 11.2 5.75 3.97 3.01 1.67 361 220 164 1.75 137 99.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.67 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.57 3.74 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.67 403 247 183 1.75 153 112 94.7 69.0 54.9 45.6 36.6 36.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 3	12-TSG-120	1.75	284	177	133	1.80	112	79.9	67.7	49.2	39.0	32.5	28.1	23.2	19.1	16.3	9.00	4.66	3.22	2.42
1.75 311		1.67	291	178	132	1.75	111	80.9	68.5	50.0	39.6	33.0	28.6	23.6	19.5	16.6	9.23	4.75	3.25	2.48
1.67 319 194 144 1.75 121 88.2 74.8 54.5 43.3 36.1 31.2 25.7 21.3 19.7 10.1 5.17 3.55 2.70 1.80 335 218 162 1.85 137 93.9 79.4 57.8 45.9 38.1 33.0 27.2 22.1 18.9 10.7 5.56 3.85 2.91 1.75 353 219 164 1.80 138 98.9 83.7 61.0 48.4 40.2 34.7 23.6 20.1 11.2 5.75 3.97 3.01 1.67 3.61 220 164 1.75 137 99.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 30.70 1.80 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.67 3.94 245 184 1.80 155 110 93.1 67.8 54.0 45.1 38.9 32.0 26.4 22.5 12.5 6.44 4.44 3.38 1.67 403 247 183 1.75 153 112 94.7 69.0 54.9 45.6 39.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 12-TSG-190 1.75 443 274 207 1.80 174 124 105 76.7 61.6 51.3 44.4 36.7 30.3 25.8 14.0 7.25 5.00 3.78 1.80 466 304 228 1.85 191 31 111 87.6 64.0 53.2 46.1 38.0 31.1 26.4 14.9 7.78 5.38 4.07 12-TSG-210 1.75 493 305 229 1.80 193 137 117 85.0 67.5 64.6 55.7 45.9 37.5 32.0 18.1 9.43 6.59 12-TSG-250 1.85 544 368 275 1.85 231 159 134 97.5 77.5 64.6 55.7 45.9 37.5 32.0 18.1 9.43 6.59 12-TSG-300 1.75 596 369 279 1.80 273 195 165 105 83.1 69.1 59.8 49.4 40.7 34.7 19.3 9.75 6.75		1.80	294	191	143	1.85	121	82.9	70.1	51.0	40.4	33.6	29.1	24.0	19.6	18.2	9.41	4.92	3.39	2.57
1.80 3.35 2.18 1.62 1.85 1.37 9.9 7.9 7.9 5.8 4.5 3.81 3.0 2.2 2.1 1.8 1.0 5.56 3.85 2.91 1.75 3.53 2.19 1.64 1.80 1.38 9.8 8.3.7 61.0 48.4 40.2 34.7 28.7 23.6 20.1 11.2 5.75 3.97 3.01 1.67 3.61 2.20 1.64 1.75 1.37 9.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.80 3.74 2.42 1.82 1.85 1.53 1.05 8.8 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.75 3.94 2.45 1.84 1.80 1.55 110 93.1 67.8 54.0 45.1 38.9 32.0 26.4 22.5 12.5 64.4 4.44 3.88 1.67 403 2.47 1.83 1.75 1.53 112 94.7 69.0 54.9 45.6 39.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 1.80 420 2.72 2.05 1.85 1.72 11.8 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 4.53 2.77 2.05 1.75 173 126 106 77.7 61.6 51.3 44.4 36.7 30.3 25.8 14.4 7.39 5.08 3.86 1.67 4.53 2.77 2.05 1.75 173 126 106 77.7 61.6 51.3 44.4 36.7 30.3 25.8 14.4 7.39 5.08 3.86 1.67 4.53 3.05 2.29 1.80 1.75 1.75 1.75 1.75 1.75 4.75 4.75 4.75 4.75 4.75 4.75 1.67 5.04 3.08 2.29 1.80 1.75 1.75 1.75 1.75 1.75 4.75 4.75 4.75 4.75 4.75 1.67 5.04 3.08 2.29 1.80 1.75 1.75 1.75 1.75 1.75 4.75 4.75 4.75 4.75 4.75 4.75 4.75 4.75 1.67 5.04 3.08 2.29 1.85 1.85 1.75	12-TSG-130	1.75	311	193	145	1.80	122	87.2	73.8	53.8	42.7	35.5	30.7	25.3	20.8	19.4	9.83	5.08	3.50	2.64
1.75 353 219 164 1.80 138 98.9 83.7 61.0 48.4 40.2 34.7 28.7 23.6 20.1 11.2 5.75 3.97 3.01 1.67 361 220 164 1.75 137 99.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.80 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.75 394 245 184 1.80 155 110 93.1 67.8 54.0 45.1 38.9 32.0 26.4 22.5 12.5 6.44 4.44 3.38 1.67 403 247 183 1.75 153 112 97.7 67.7 67.7 67.7 67.7 48.1 41.5 41.5 41.5 41.5 41.5 41.5 41.5 1.75 443 274 207 1.80 174 124 105 76.7 60.8 50.5 43.8 36.1 29.8 25.3 14.0 7.25 5.00 3.78 1.80 466 304 228 1.85 191 131 111 80.6 64.0 53.2 46.1 38.0 31.1 26.4 14.9 7.78 53.8 4.07 1.81 4.82 4.83 4.83 4.83 4.84 4.83 4.84 4.84 4.84 4.84 4.84 4.84 1.81 4.83 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 1.81 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 1.82 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 1.83 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 1.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84 4.84 4.84 1.85 4.84 4.84		1.67	319	194	144	1.75	121	88.2	74.8	54.5	43.3	36.1	31.2	25.7	21.3	19.7	10.1	5.17	3.55	2.70
1.67 361 220 164 1.75 137 99.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.80 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.75 394 245 184 1.80 155 110 93.1 67.8 54.0 45.1 38.9 32.0 26.4 22.5 12.5 6.44 4.44 3.38 1.67 403 247 183 1.75 153 112 94.7 69.0 54.9 45.6 39.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 12-TSG-190 1.75 443 274 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.75 173 126 106 77.7 61.6 51.3 44.4 36.7 30.3 25.8 14.0 7.25 5.00 3.78 12-TSG-210 1.75 493 305 229 1.80 193 137 117 85.0 67.5 56.2 48.8 40.0 33.1 26.4 14.9 7.78 5.38 4.07 12-TSG-250 1.80 564 368 275 1.85 231 159 134 71.5 77.5 64.6 55.7 49.4 40.8 33.7 28.6 16.0 8.19 5.64 4.28 12-TSG-300 1.75 596 369 279 1.80 235 167 141 103 81.7 69.5 49.4 40.7 34.7 19.3 9.93 6.83 5.18 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0		1.80	335	218	162	1.85	137	93.9	79.4	57.8	45.9	38.1	33.0	27.2	22.1	18.9	10.7	5.56	3.85	2.91
1.67 361 220 164 1.75 137 99.9 84.8 61.8 49.1 40.8 35.4 29.2 24.0 20.5 11.4 5.88 4.03 3.07 1.80 374 242 182 1.85 153 105 88.7 64.3 51.0 42.6 36.9 30.4 24.7 21.2 11.9 6.23 4.32 3.26 1.75 394 245 184 1.80 155 110 93.1 67.8 54.0 45.1 38.9 32.0 26.4 22.5 12.5 6.44 4.44 3.38 1.67 403 247 183 1.75 153 112 94.7 69.0 54.9 45.6 39.6 32.6 27.0 22.9 12.7 6.57 4.50 3.41 12-TSG-190 1.75 443 274 205 1.85 172 118 99.5 72.7 57.7 48.1 41.5 34.2 27.9 23.8 13.4 7.02 4.85 3.67 1.67 453 277 205 1.75 173 126 106 77.7 61.6 51.3 44.4 36.7 30.3 25.8 14.0 7.25 5.00 3.78 12-TSG-210 1.75 493 305 229 1.80 193 137 117 85.0 67.5 56.2 48.8 40.0 33.1 26.4 14.9 7.78 5.38 4.07 12-TSG-250 1.80 564 368 275 1.85 231 159 134 71.5 77.5 64.6 55.7 49.4 40.8 33.7 28.6 16.0 8.19 5.64 4.28 12-TSG-300 1.75 596 369 279 1.80 235 167 141 103 81.7 69.5 49.4 40.7 34.7 19.3 9.93 6.83 5.18 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0 11.4 7.83 5.92 12-TSG-300 1.75 695 431 323 1.80 273 195 165 120 95.1 79.1 68.6 56.5 46.6 39.6 22.0	12-TSG-150	1.75	353	219	164	1.80	138	98.9	83.7	61.0	48.4	40.2	34.7	28.7	23.6	20.1	11.2	5.75	3.97	3.01
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1.67 711 434 322 1.75 270 197 167 122 96.6 80.4 69.8 57.6 47.4 40.4 22.5 11.6 7.94 6.03	12-TSG-300																		_	_
		1.67	711	434	322	1.75	270	197	167	122	96.6	80.4	69.8	57.6	47.4	40.4	22.5	11.6	7.94	6.03

^{*}Actual Battery Discharge Data may be $\pm\,5\%$ of figures shown.

DIMENSIONS

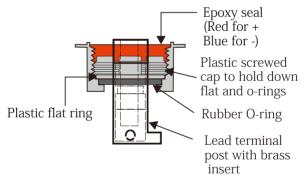


Dimensions, Weights, Data

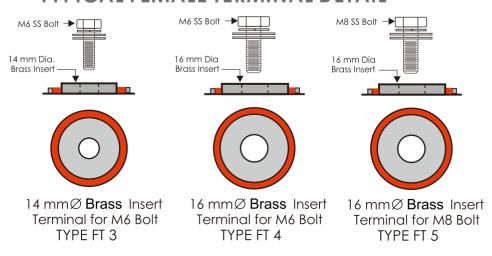
SEC	SEC Capacity Short		Internal	Femal	Batt	ery	Ove	erall	Batte	ery	Dimensi	ons
Battery	C/10	Circuit	resistance	Terminal	We	ight	Len	gth	Width		Hei	ght
Туре	1.80 Vpc	Amps	m Ohms	Туре	KG	lbs	Inch	mm	Inch	mm	Inch	mm
6-TSG-130	105	3200	3.0	FT4	16.0	35.2	7.68	195	6.69	170	8.13	207
6-TSG-220	175	5000	2.3	FT5	31.5	69.3	12.7	323	7.01	178	9.25	235
6-TSG-250	202	5400	2.1	FT5	33.0	72.6	9.57	243	7.40	188	10.8	275
12-TSG-20	14.9	750	12	FT3	6.00	13.2	7.07	180	2.99	76	6.61	168
12-TSG-30	22.8	1100	8	FT3	10.00	22.0	6.54	165	4.96	127	6.93	176
12-TSG-40	27.2	1500	7	FT3	11.00	24.2	7.72	196	5.16	131	6.34	161
12-TSG-50	36.8	1700	6.0	FT3	14.80	32.5	7.76	197	6.54	166	6.69	170
12-TSG-60	48.2	1900	5.6	FT3	19	41.8	9.02	229	5.43	138	8.43	214
12-TSG-70	57.0	2000	5.5	FT3	21.3	46.9	13.80	350	6.61	168	7.05	179
12-TSG-80	61.4	2100	5.4	FT3	25.5	56.1	10.2	259	6.61	168	8.44	215
12-TSG-90	70.1	2400	4.5	FT3	26.5	58.3	10.2	259	6.61	168	8.46	215
12-TSG-100	78.9	2650	4.3	FT3	30.5	67.1	12.1	307	6.65	169	8.46	215
12-TSG-110	87.7	2900	3.9	FT4	32.5	71.5	13.0	330	6.69	170	8.46	215
12-TSG-120	96.4	3000	3.4	FT4	34.0	74.8	13.3	339	6.81	173	8.86	225
12-TSG-130	105	3300	3.1	FT4	36.0	79.2	13.3	339	6.81	173	8.86	225
12-TSG-150	119	4200	2.9	FT4	42.5	93.5	13.5	342	6.81	173	11.22	285
12-TSG-170	133	4500	2.7	FT5	48.5	107	19.0	483	6.69	170	9.49	241
12-TSG-190	150	4600	2.5	FT5	57.0	125	20.9	530	8.23	209	8.86	225
12-TSG-210	167	4700	2.3	FT5	60.0	132	20.9	530	8.23	209	8.86	225
12-TSG-250	202	5400	2.2	FT5	66.0	145	20.6	522	9.45	240	8.86	225
12-TSG-300	235	5400	2.2	FT5	80.5	177	20.6	522	10.55	268	8.666	220

^{*}Actual Dimension may be \pm 5% from the figures shown.

TYPICAL TRIPLE SEAL DETAIL



TYPICAL FEMALE TERMINAL DETAIL



INFORMATION



The Worlds First - Monobloc Catalyst Battery

SEC CELLYTE Solar TSG Monobloc batteries are the first to use a CatVent Catalyst in the cell head space. This is done for several very good reasons. The Catalyst changes the electrochemical actions within the cell, this causes balance within the cell preventing the negative plate from depolarising over time and improves cell capacity. A healthy balance in the cell will be immediately obvious by a reduction of the cell's flat current by up to 50%. What that means is a dramatic reduction, by up to 80% in cell gassing, reduced loss which delays cell dry out*, reduced positive plate corrosion, reduced cell heating, reducing the risk of thermal run away and a reduction in the energy required to cool the cells / batteries.

*Please note: Battery dry out is one of the major failure modes of VRLA batteries.

How It Works

The VRLA cell was designed to correct all the problems of flooded technology. All the gas produced inside the cell was intended to recombine back into water on the negative plate self discharge, no positive plate corrosion and no excess charge current needed. Batteries would last forever and go gas would be released from the cell.

In the real world, chemistry dictates that negative plates do self-discharge and they do this more when impurities are present in higher quantities. In our experience the typical high quality, long life (20 yr) VRLA cell has a self discharge rate equivalent to 80ml of Hydrogen gas per day per 100Ah. Oxygen, produced from a variety of processes on the positive plate, will recombine with this hydrongen on the negative plate and cause it to depolarize.

In the real would positive grids also corrode. Designers have done what is typically done on flooded designs for long life and reduced the corrosion rate of the positive grid. Typical state of the art designs will only absorb 10 ml of oxygen on the positive plate instead of the 40ml needed to counter act the hydrogen generated on the negative. This is the paradox of VRLA design. A "better" positive grid can actually impair the life of the design.

This leaves an unbalanced situation with a strongly depolarized negative plate. The charging system will compensate with more current which will lead to excessively high polarization on the positive plate and damaging effects on the cell to the excess current. Electrolysis will generate effects on the cell due to the excess current.

Adding a Microcat™ to the cell gives battery designer a new tool

to break out of the deadlock. The catalyst will absorb free oxygen in the headspace and recombine it with the amount of gas venting from the cell, but most importantly this prevents oxygen from reaching the negative plate and buffers the negative plate self discharge reaction from the positive plate corrosion reaction. Now that the cell is in balance the negative remains charged. The charging system responds by only sending the small amount of current needed to keep the cell charged.

Benefits of Catalyst in SEC VRLA Batteries

One of the most immediate, observable effects of installing a catalyst in a VRLA cell is a sudden drop in the float current. Typically float currents are one half or less when a catalyst is installed. Adding a catalyst to the cell prevents some of the oxygen reaching the negative plate and allows the negative plate to stay polarized. This means that less current needs to be supplied to the cell from the charging system, manifesting itself as lower float current, leading to the following benefit:

*Minimize water loss

Gasses are recombined into water inside the cell rather than exiting the cell. Too much gas leaving the cell can lead to premature dry-out and cell failure. Cell dry out is a major cause of VRLA cell failure.

*Increase life

There are many potential failure modes of VRLA cells. A number of these failure modes can be mitigated by the catalyst technology such as: Cell dry out, positive plate corrosion, thermal runaway, capacity loss due to negative plate depolarization.

*Minimize positive plate corrosion

A reduction in float current reduces the amount of over-charge on the positive plate which directly impacts the corrosion rate. The design life of a lead acid battery is based on the corrosion of the plate barring any other unforseen failure modes.

*Maintain cell capacity

Many VRLA cells in service are failing capacity tests because their negative plates are depolarized. In fact significant capacity increase have been seen on some cells just by installing a catalyst.

SEC ALL PRODUCT RANGE 55







CELLYTE 2CMT/G Modular Steel Rack

CELLYTE 2TLAM/G Tubular Steel Rack

CELLYTE 2CMT/G, CELLYTE 2TLAM/G with Catalyst









CELLYTE 12PLF & 12PLT Range CELLYTE 12FTA/G Range

CELLYTE 6-12TUA Range

CELLYTE 6-12TSG Range









CELLYTE 6-12TLA Range

CELLYTE 6-12TLG Range

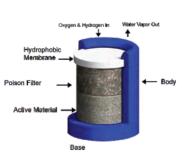
MICROLYTE +Plus Range

MICROLYTE Red Top Range









CELLYTE 2ETG OPzV Range Tubular Steel Rack

CELLYTE TRA Range

Nickel Cadmium Range Pocket Plate flooded and VR

Typical VRLA catalyst

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