



Haze Battery Company Ltd



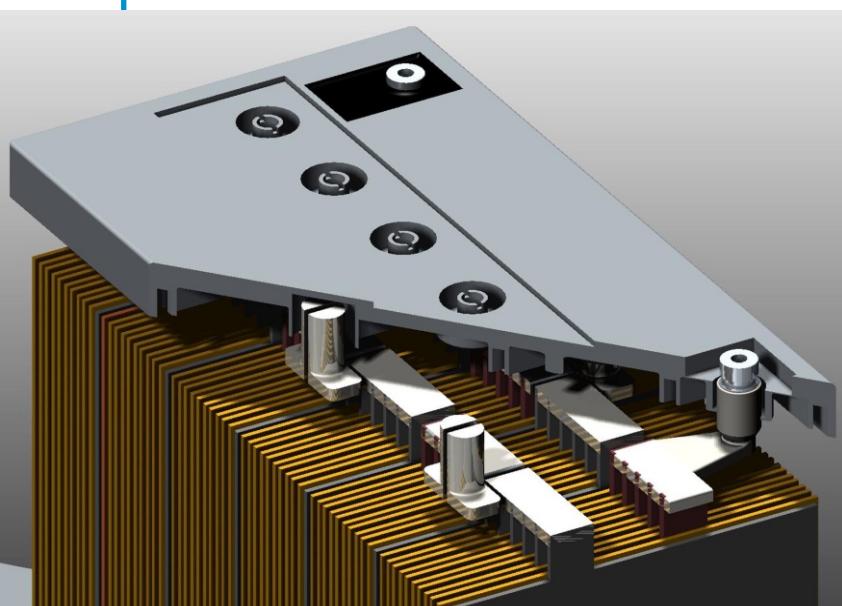
**Sealed Lead Acid 6 & 12 Volt
Monobloc
Gelled Electrolyte Range**

CONSTRUCTION - Gel battery construction is as shown in the diagram. The positive and negative grids are cast from a calcium/tin lead alloy to reduce grid growth and corrosion. The active material is manufactured from a high purity lead (99.9999%) to minimize the negative effects of impurities.

Separator is manufactured by a world leader in the field, utilizing the latest German technology. The base material is a microporous duroplastic exhibiting excellent high temperature stability and mechanical strength, resulting in very good resistance to vibration and mechanical shock. The integrity of the battery will be maintained under extreme conditions.

The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the gelled electrolyte.

The separator also has an open construction, which allows little resistance to the flow of the electrolyte during filling. A thin layer (typically 0.4mm) of non-woven glass mat is an integral part of the separator and is placed against the positive plate for improved surface contact.

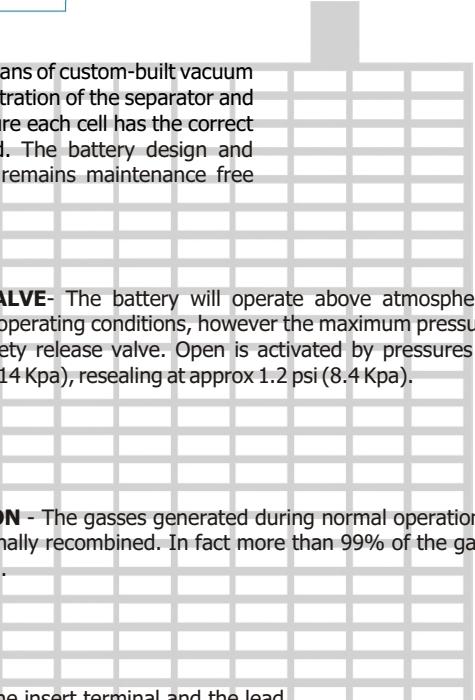


Typical separator properties are:

Acid displacement -150 ml /sqm
Pore volume - 70%
Average pore size - 0.5 micro m
Maximum pore Diameter - 1 micro m

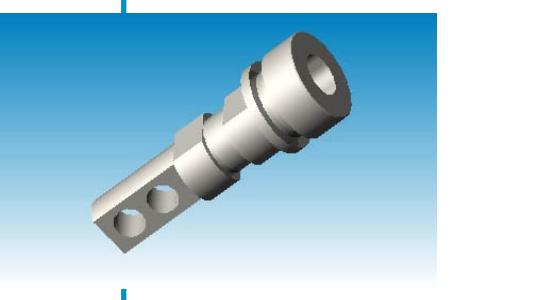
Gel construction with case removed and cover cut away to show internal battery parts.

ELECTROLYTE FILLING - Gelled electrolyte is introduced to the cell by means of custom-built vacuum filling machines it is vitally important that the electrolyte achieves full penetration of the separator and plates therefore; vacuum cycling is utilized after the filling process. To ensure each cell has the correct amount of gel, they are first overfilled, the extra gel is then removed. The battery design and construction negates the need for electrolyte addition and the battery remains maintenance free throughout its design life.



SAFETY RELEASE VALVE- The battery will operate above atmospheric pressure under normal operating conditions, however the maximum pressure is governed by the safety release valve. Open is activated by pressures in excess of approx. 2 psi (14 Kpa), resealing at approx 1.2 psi (8.4 Kpa).

GAS RECOMBINATION - The gasses generated during normal operation of the battery are internally recombined. In fact more than 99% of the gas achieves recombination.



TERMINAL CONSTRUCTION - The contact quality between the insert terminal and the lead post is of vital importance during short duration / high Amp discharges. Elevated terminal temperatures are the result of poor contact, eventually causing seal degradation and electrolyte leaks. Haze design and assembly technique for terminal casting ensures trouble free operation for the design life of the battery.

Gel Vs AGM

Each battery has its advantages and disadvantages, it is therefore important to choose the right battery for the application. Advantages of Gel Batteries:

- Full recovery from deep discharge, even when the battery is not recharged immediately.
- Ideal for repeat cycling daily use.
- Excellent performance over long discharges
- Good tolerance to higher temperature applications
- Suitable where mains power is unstable
- Zero stratification due to immobilized electrolyte
- No equalization charge necessary
- Reduced self-discharge
- Limiting design protects the positive plates to greatly improve cycle life
- Thicker plates for reduced grid corrosion and increased cycle life
- Improved charge acceptance due to low internal resistance
- High resistance to water loss with the right charging set up
- Ultra stable polymer separator with glass mat for increased performance
- High resistance to shorting due to superior mechanical strength of the polymer separator
- Increased tolerance to poor charging parameters
- Can be discharged even when full recharge has not been achieved, without loss of battery capacity

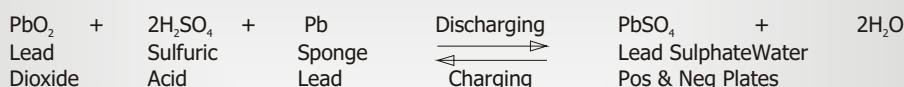


Applications

- Cycling / Float service
 - Residential
 - Telecommunications
 - Refrigeration
 - Photovoltaic
 - Solar
 - Wind
 - Engine Starting
 - Wheelchair
 - Electric Vehicle
 - Floor Cleaning Machines
 - Water Pumping
 - Golf Caddy
 - Portable Medical Equipment
 - Cathodic Protection
 - Boats
 - General Marine
 - Navigation Aids
- Many other deep cycle applications

Capacity temperature correction Factor to be applied to Data at 20 Degrees C									
Discharge Time	0 °C	5 °C	10 °C	15 °C	20 °C	25 °C	30 °C	35 °C	40 °C
5 minutes to 59 minutes	0.8	0.86	0.91	0.96	1	1.037	1.063	1.085	1.1
1 Hour to 100 Hours	0.86	0.9	0.93	0.97	1	1.028	1.05	1.063	1.07

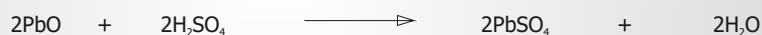
CHEMICAL REACTION- The chemical reaction for the Discharge / Recharge process is represented by the following formula:



Under normal float charge conditions the oxygen passes through the separator from the positive to the negative plate where it reacts with the negative active material to form lead oxide.



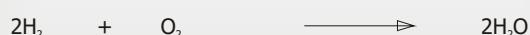
In the acid conditions the lead oxide reacts with the sulfuric acid to form lead sulphate.

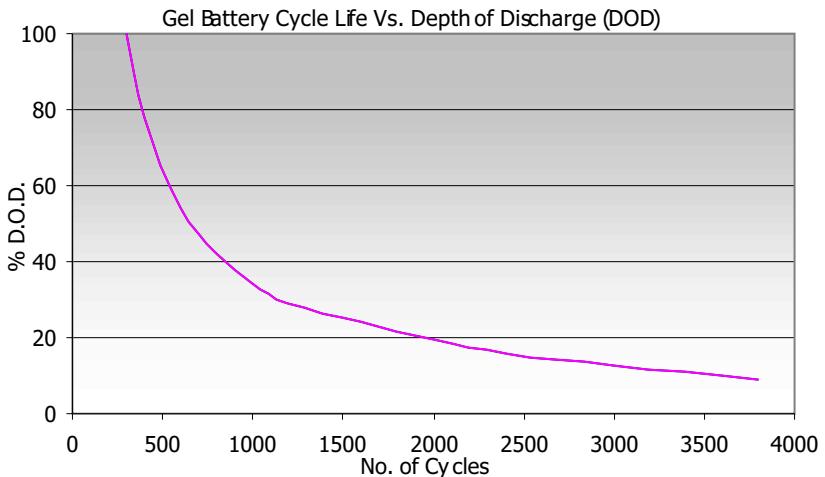


The lead sulphate formed on the negative is then reduced to lead and sulfuric acid by the evolving hydrogen.



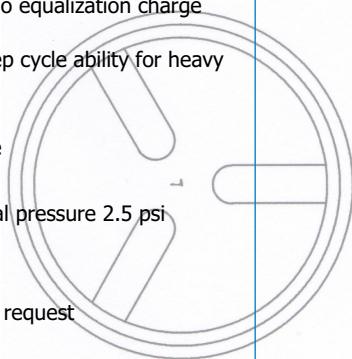
If the equations are resolved and like terms cancelled out on both sides of the equation the result is:





Innovative Features

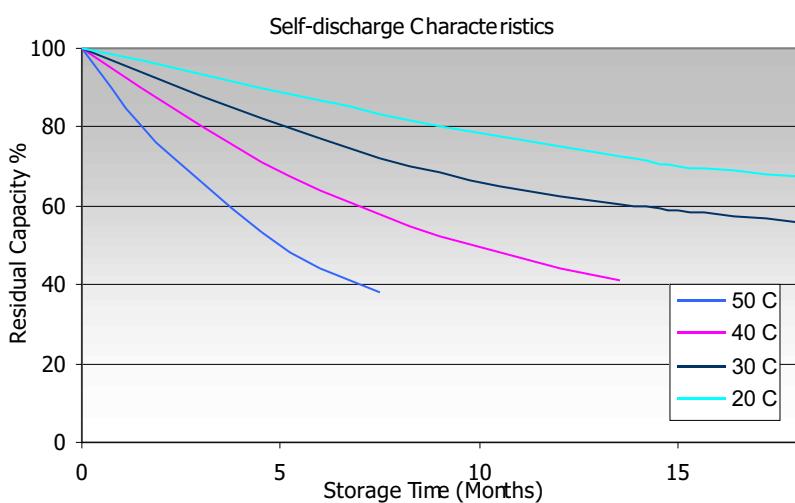
- Completely maintenance free, sealed
- Construction eliminates the need for watering
- Electrolyte will not stratify, no equalization charge required
- Increased durability and deep cycle ability for heavy demand applications
- Fully tank formed plates
- Gelled thixotropic electrolyte
- Spill proof / leak proof
- Valve regulated Max internal pressure 2.5 psi
- Multi-position usage
- Multi-cell container
- ABS Case and cover - V0 on request
- Low self discharge
- Utilising the latest in German technology
- FAA and IATA approved as non-hazardous



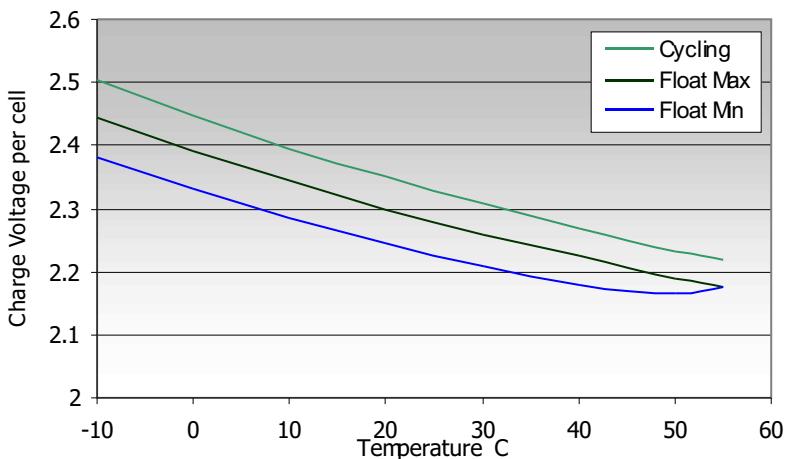
Specifications

Nominal Voltage	6 & 12 Volts
Design Life	12 Years
Operating Temperature	-20 °C to 50 °C
Grid alloy	Calcium / Tin lead alloy
Plates	Flat Pasted
Separator	Microporous Duroplastic
Active material	Very high purity lead
Case and cover	ABS (V0 on request)
Charge Voltage	Float 2.27 - 2.30 VPC @20 °C Cycling 2.4 @20 °C
Electrolyte	Max. 2.4 VPC Max ripple 0.05C (A)
Venting Valve	Sulphuric acid Analytical grade purity EPDM Rubber 1.5 to 2 psi (10.5 - 14 KPa) release pressure. Resealing at 1 psi (7 KPa)
Terminal	Various types Epoxy sealed by extended mechanical paths
Torque setting	The recommended torque value for all types is 5-7 Nm
Cables	Insulated cables / connectors supplied on request.

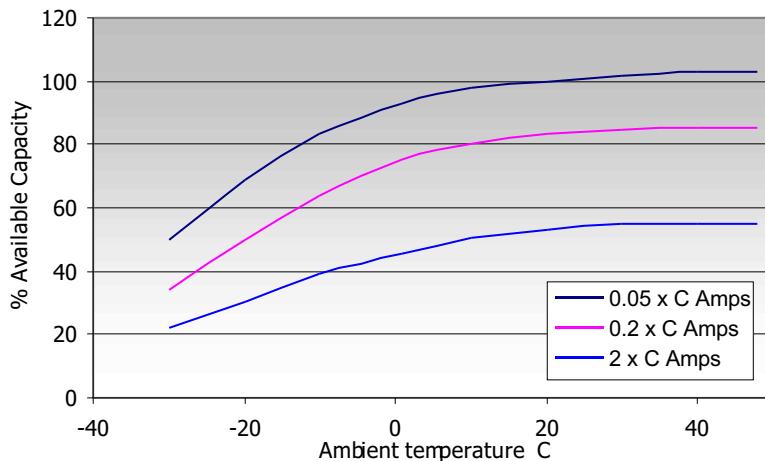
Haze Battery Company keenly encourages environmental awareness; PLEASE follow guidelines for the recycling /disposal of lead.



Relationship Between Charge Voltage and Temperature



Capacity Vs Ambient Temperature



CHARGING CHARACTERISTICS

Floating - The optimum float voltage for a battery is temperature dependant, at 15 - 24°C the recommended value is 2.27 - 2.30V. It is recommended that battery installation sites are temperature controlled, however float voltage can be increased or decreased to compensate for temperature variations. Adjustment is calculated at +/- 3 mV per degree C.

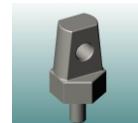
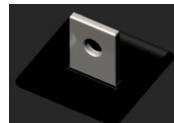
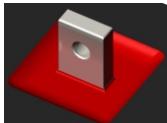
Terminal Options (left to right)

- Lead Flag
- Automotive
- J Type
- Copper Flag
- J Type Adapter
- Insert

Insert are made from brass with copper, nickel and silver plating giving excellent mechanical, electrical and corrosion resistant properties.

Operating Temperature	Recommended Applied Float Voltage VPC
0-9	2.33 - 2.35
10-14	2.30 - 2.33
15-19	2.27 - 2.30
20-24	2.27 - 2.30
25-29	2.25 - 2.27
30-34	2.23 - 2.25
35-40	2.21 - 2.23

The most suitable charging method for battery life and performance is the constant voltage method with a limited initial current, usually limited to a maximum of $C_{20}/4$.





Amps & Ampere Hours Data

Battery Model	Time in Minutes - Amps to 1.85 VPC												
	5	10	15	20	25	30	35	40	45	50	60	90	
HZY6-7.5	14.5	10.9	8.90	7.66	6.55	5.76	5.17	4.69	4.32	4.00	3.46	2.70	
HZY6-10	20.5	15.5	12.3	10.61	9.19	8.04	7.17	6.52	6.00	5.53	4.83	3.65	
HZY6-12	25.0	18.7	14.9	12.6	10.9	9.56	8.52	7.75	7.16	6.68	5.88	4.41	
HZY12-7.5	14.5	10.86	8.90	7.66	6.55	5.76	5.17	4.69	4.32	4.00	3.46	2.70	
HZY12-12	25.0	18.7	14.9	12.6	10.9	9.56	8.52	7.75	7.16	6.68	5.88	4.41	
HZY12-18	35.4	26.8	22.4	19.1	16.7	14.8	13.3	12.0	10.9	10.0	8.8	6.7	
HZY12-26	62.8	46.9	38.1	32.2	28.0	24.9	22.4	20.3	18.6	17.1	15.0	11.0	
HZY12-33	78.7	61.0	48.8	40.7	35.6	31.8	28.4	25.9	23.7	21.8	18.7	13.3	
HZY12-44	97	79.1	64.5	54.3	46.9	41.4	37.3	33.8	31.1	28.8	25.1	17.8	
HZY12-55	117	95.9	78.6	65.0	55.1	48.5	43.9	40.3	37.4	35.0	30.6	22.1	
HZY12-70J	135	110	93.3	81.2	70.8	63.5	57.8	53.4	49.8	47.1	41.6	29.3	
HZY12-70	138	112	95.2	82.8	72.2	64.8	58.9	54.5	50.8	48.0	42.4	29.9	
HZY12-80	151	119	99	86.9	77.9	69.6	64.3	60.2	56.1	53.3	47.0	34.1	
HZY12-90	169	135	114	99	87.5	79.5	72.4	66.4	61.5	57.3	51.2	37.6	
HZY12-100	179	146	124	107	94.3	84.6	76.9	71.0	65.9	61.9	54.4	39.1	
HZY12-110	203	169	142	124	110	100	89.7	81.7	74.3	68.5	59.7	44.4	
HZY12-120	217	182	155	135	122	110	99	92	84.3	77.8	69.5	50.8	
HZY12-135	211	174	161	147	136	124	115	107	99	92.8	81.2	59.0	
HZY12-150	233	206	180	162	147	135	124	114	105	97	86.3	63.6	
HZY12-160	240	213	190	170	159	145	133	123	114	106	95.9	70.5	
HZY12-200	267	238	210	189	173	162	151	141	132	124	110	80.1	
HZY12-230	295	260	227	207	192	180	168	159	147	140	128	93.9	
HZY6-110	207	172	145	126	112	102	91.5	83.3	75.8	69.9	60.9	45.3	
HZY6-160	250	221	197	177	165	151	138	128	119	110	100	73.3	
HZY6-200	267	238	210	189	173	162	151	141	132	124	110	80.1	

Battery Model	Time in Hours - Amps to 1.85 VPC												
	2	3	4	5	6	7	8	9	10	12	20		
HZY6-7.5	2.16	1.50	1.16	0.96	0.81	0.72	0.64	0.58	0.53	0.46	0.33		
HZY6-10	2.89	2.02	1.56	1.29	1.11	0.97	0.86	0.78	0.71	0.62	0.43		
HZY6-12	3.54	2.49	1.93	1.60	1.37	1.20	1.09	0.99	0.91	0.79	0.55		
HZY12-7.5	2.16	1.50	1.16	0.96	0.81	0.72	0.64	0.58	0.53	0.46	0.33		
HZY12-12	3.54	2.49	1.93	1.60	1.37	1.20	1.09	0.99	0.91	0.79	0.55		
HZY12-18	5.35	3.88	3.00	2.48	2.09	1.83	1.62	1.46	1.34	1.13	0.77		
HZY12-26	8.91	6.68	5.26	4.34	3.41	3.02	2.69	2.42	2.21	1.89	1.26		
HZY12-33	10.2	7.02	5.55	4.65	4.03	3.57	3.24	2.92	2.68	2.33	1.55		
HZY12-44	13.8	9.51	7.24	5.97	5.10	4.46	4.04	3.68	3.38	2.90	1.89		
HZY12-55	17.2	12.0	9.39	7.75	6.63	5.85	5.23	4.70	4.29	3.67	2.47		
HZY12-70J	22.5	15.4	11.8	9.7	8.29	7.27	6.46	5.85	5.36	4.58	3.05		
HZY12-70	22.9	15.7	12.1	9.9	8.46	7.41	6.60	5.97	5.47	4.67	3.11		
HZY12-80	26.4	18.0	14.0	11.6	9.9	8.66	7.64	6.83	6.20	5.33	3.54		
HZY12-90	29.6	20.8	16.1	13.1	11.1	9.7	8.60	7.75	7.09	6.09	4.02		
HZY12-100	30.5	21.5	16.8	13.9	11.8	10.5	9.34	8.42	7.66	6.57	4.28		
HZY12-110	35.0	24.5	18.9	15.5	13.5	12.0	10.7	9.61	8.73	7.47	4.96		
HZY12-120	39.7	27.8	21.2	17.4	14.8	13.0	11.8	10.7	9.7	8.34	5.42		
HZY12-135	46.2	31.4	23.9	19.5	16.5	14.5	13.0	11.7	10.7	9.21	5.98		
HZY12-150	49.3	33.9	26.2	21.6	18.5	16.3	14.6	13.2	12.0	10.2	6.73		
HZY12-160	55.6	38.7	30.1	24.8	21.1	18.7	16.6	14.9	13.7	11.6	7.46		
HZY12-200	63.3	45.1	35.4	29.1	24.8	21.7	19.4	17.5	16.1	13.8	9.01		
HZY12-230	74.3	52.2	40.7	33.7	29.1	25.4	22.6	20.5	18.8	16.0	10.4		
HZY6-110	35.7	25.0	19.3	15.8	13.7	12.2	10.9	9.8	8.90	7.61	5.06		
HZY6-160	57.8	40.2	31.3	25.8	22.0	19.5	17.3	15.5	14.2	12.1	7.76		
HZY6-200	63.3	45.1	35.4	29.1	24.8	21.7	19.4	17.5	16.1	13.8	9.01		

Battery Model	Time in Hours Ah to 1.85 VPC												
	2	3	4	5	6	7	8	9	10	12	20		
HZY6-7.5	4.31	4.49	4.65	4.79	4.87	5.01	5.13	5.20	5.35	5.54	6.60		
HZY6-10	5.78	6.07	6.26	6.43	6.64	6.76	6.89	7.02	7.14	7.44	8.65		
HZY6-12	7.08	7.48	7.73	7.98	8.20	8.40	8.69	8.91	9.12	9.51	10.9		
HZY12-7.5	4.31	4.49	4.65	4.79	4.87	5.01	5.13	5.20	5.35	5.54	6.60		
HZY12-12	7.08	7.48	7.73	7.98	8.20	8.40	8.69	8.91	9.12	9.51	10.9		
HZY12-18	10.7	11.6	12.0	12.4	12.6	12.8	13.0	13.1	13.4	13.5	15.5		
HZY12-26	17.8	20.0	21.1	21.7	20.4	21.1	21.5	21.8	22.1	22.7	25.2		
HZY12-33	20.4	21.1	22.2	23.2	24.2	25.0	25.9	26.3	26.8	27.9	31.0		
HZY12-44	27.7	28.5	29.0	29.8	30.6	31.2	32.3	33.2	33.8	34.8	37.8		
HZY12-55	34.4	36.1	37.6	38.7	39.8	40.9	41.8	42.3	44.1	44.4	49.4		
HZY12-70J	44.9	46.3	47.3	48.3	49.7	50.9	51.7	52.7	53.6	54.9	61.0		
HZY12-70	45.8	47.2	48.3	49.3	50.7	51.9	52.8	53.7	54.7	56.1	62.3		
HZY12-80	52.7	54.0	56.0	57.9	59.2	60.6	61.1	62.0	64.0	70.9	70.9		
HZY12-90	59.2	62.3	64.2	65.5	66.8	67.9	68.8	69.7	70.9	73.1	80.4		
HZY12-100	61.1	64.5	67.2	69.5	71.1	73.2	74.7	75.8	76.6	78.9	85.5		
HZY12-110	70.0	73.5	75.7	77.5	80.7	84.0	85.4	86.5	87.3	89.6	99		
HZY12-120	79.4	83.5	84.8	86.782	88.9	91.2	94.1	96.0	97	100	108		
HZY12-135	92.4	94.1	95.5	98	99	102	104	106	111	120	120		
HZY12-150	99	102	105	108	111	114	116	119	120	123	135		
HZY12-160	111	116	121	124	127	131	133	134	137	140	149		
HZY12-200	127	135	142	145	149	155	158	161	165	180	180		
HZY12-230	149	157	163	169	175	178	181	184	188	192	208		
HZY6-110	71.4	75.0	77.2	79.1	82.4	85.7	87.1	88.2	89.0	91.4	101.3		
HZY6-160	116	121	125	129	132	136	138	140	142	145	155		
HZY6-200	127	135	142	145	149	152	155	158	161	165	180		

Battery Model	Time in Hours - Amps to **1.80 VPC**												
2	3	4	5	6	7	8	9	10	12	20			

Battery Model	Time in Minutes - Amps to 1.75 VPC											
	5	10	15	20	25	30	35	40	45	50	60	90
HZY6-7.5	18.3	13.7	11.2	9.6	8.2	7.20	6.45	5.85	5.37	4.97	4.30	3.35
HZY6-10	26.0	19.5	15.5	13.3	11.5	10.0	8.95	8.13	7.47	6.88	6.00	4.52
HZY6-12	31.6	23.6	18.7	15.8	13.6	11.9	10.6	9.66	8.91	8.30	7.30	5.47
HZY12-7.5	18.3	13.7	11.2	9.60	8.20	7.20	6.45	5.85	5.37	4.97	4.30	3.35
HZY12-12	31.6	23.6	18.7	15.8	13.6	11.9	10.6	9.66	8.91	8.30	7.30	5.47
HZY12-18	42.7	31.1	24.5	21.1	18.0	15.6	13.9	12.5	11.4	10.5	9.19	6.99
HZY12-26	70.2	52.0	41.3	34.2	29.7	26.3	23.6	21.3	19.5	17.9	15.7	11.3
HZY12-33	91.9	68.7	53.4	44.4	37.8	33.6	29.8	26.9	24.6	22.7	19.6	13.7
HZY12-44	111	92.8	74.6	60.3	51.6	45.1	39.9	35.8	32.5	30.1	26.0	18.4
HZY12-55	135	115	91.3	73.1	61.2	53.4	47.5	43.4	39.9	36.9	31.9	22.6
HZY12-70J	160	136	112.0	92.2	79.2	69.3	62.5	57.5	53.3	49.7	42.7	30.0
HZY12-70	163	139	114	94.1	80.8	70.7	63.7	58.6	54.4	50.7	43.5	30.6
HZY12-80	171	148	125	107	91.8	80.7	72.9	66.9	62.6	58.5	50.7	35.2
HZY12-90	206	173	142	121	102	88.9	79.2	72.2	66.8	61.7	54.0	38.7
HZY12-100	232	184	145	121	104	91.7	82.9	76.0	70.1	65.6	56.8	40.4
HZY12-110	264	217	173	145	125	110	97	88.5	80.7	74.0	63.8	45.8
HZY12-120	278	231	184	156	136	120	108	98	91.3	84.1	72.9	52.4
HZY12-135	292	213	183	161	145	132	121	113	105	98	85.4	61.6
HZY12-150	320	260	217	189	169	153	139	128	117	109	94.0	65.6
HZY12-160	348	285	235	207	184	167	153	142	131	121	105	74.2
HZY12-200	365	307	262	233	209	190	175	163	152	143	127	88.6
HZY12-230	376	316	267	243	220	202	186	171	162	152	136	98
HZY6-110	269	221	176	148	128	112	99	90.3	82.3	75.4	65.1	46.7
HZY6-160	355	296	240	215	191	173	159	147	136	125	109	77.2
HZY6-200	365	307	262	233	209	190	175	163	152	143	127	88.6

Battery Model	Time in Hours - Amps to 1.75 VPC										
	2	3	4	5	6	7	8	9	10	12	20
HZY6-7.5	2.67	1.85	1.43	1.18	1.00	0.88	0.78	0.70	0.65	0.56	0.39
HZY6-10	3.58	2.50	1.93	1.58	1.36	1.18	1.05	0.95	0.87	0.75	0.51
HZY6-12	4.38	3.08	2.38	1.96	1.68	1.47	1.33	1.20	1.11	0.96	0.64
HZY12-7.5	2.67	1.85	1.43	1.18	1.00	0.88	0.78	0.70	0.65	0.56	0.39
HZY12-12	4.38	3.08	2.38	1.96	1.68	1.47	1.33	1.20	1.11	0.96	0.64
HZY12-18	5.55	4.00	3.13	2.58	2.20	1.91	1.70	1.53	1.39	1.17	0.80
HZY12-26	9.07	6.76	5.32	4.40	3.54	3.14	2.80	2.52	2.29	1.95	1.29
HZY12-33	10.6	7.33	5.79	4.83	4.16	3.71	3.37	3.04	2.76	2.40	1.59
HZY12-44	14.4	9.9	7.61	6.25	5.32	4.68	4.24	3.83	3.52	3.02	1.97
HZY12-55	17.6	12.5	9.8	8.06	6.89	5.42	4.87	4.47	3.82	3.27	
HZY12-70J	22.9	15.9	12.1	10.0	8.53	7.45	6.62	5.97	5.47	4.72	3.14
HZY12-70	23.4	16.2	12.4	10.2	8.70	7.61	6.75	6.09	5.58	4.82	3.21
HZY12-80	26.9	18.5	14.3	11.9	10.2	8.94	7.92	7.06	6.46	5.55	3.69
HZY12-90	30.4	21.3	16.5	13.6	11.6	10.1	8.95	8.07	7.38	6.34	4.19
HZY12-100	31.8	22.2	17.2	14.1	12.2	10.8	9.63	8.72	7.97	6.84	4.45
HZY12-110	36.1	25.1	19.5	16.1	14.1	12.4	11.0	10.0	9.08	7.77	5.17
HZY12-120	41.4	28.7	22.0	18.0	15.3	13.5	12.2	11.1	10.1	8.68	5.65
HZY12-135	48.2	32.9	25.0	20.3	17.3	15.1	13.5	12.3	11.2	9.58	6.22
HZY12-150	50.9	35.0	26.9	22.2	19.2	16.8	15.0	13.7	12.5	10.6	7.05
HZY12-160	57.8	39.9	30.7	25.4	22.0	19.5	17.4	15.6	14.2	12.1	7.77
HZY12-200	68.8	48.0	37.6	30.6	25.9	22.5	20.2	18.3	16.7	14.3	9.38
HZY12-230	76.2	53.2	41.7	34.7	30.0	26.4	23.5	21.2	19.6	16.7	10.8
HZY6-110	36.8	25.6	19.9	16.4	14.4	12.7	11.3	10.2	9.26	7.92	5.27
HZY6-160	60.1	41.5	31.9	26.4	22.9	20.3	18.1	16.3	14.8	12.6	8.08
HZY6-200	68.8	48.0	37.6	30.6	25.9	22.5	20.2	18.3	16.7	14.3	9.38

Battery Model	Time in Hours Ah to 1.75 VPC										
	2	3	4	5	6	7	8	9	10	12	20
HZY6-7.5	5.33	5.54	5.73	5.89	5.97	6.13	6.25	6.33	6.49	6.68	7.70
HZY6-10	7.15	7.49	7.71	7.91	8.14	8.27	8.40	8.54	8.67	8.98	10.1
HZY6-12	8.75	9.23	9.52	9.81	10.1	10.3	10.6	10.8	11.1	11.5	12.8
HZY12-7.5	5.33	5.54	5.73	5.89	5.97	6.13	6.25	6.33	6.49	6.68	7.70
HZY12-12	8.75	9.23	9.52	9.81	10.1	10.3	10.6	10.8	11.1	11.5	12.8
HZY12-18	11.1	12.0	12.5	12.9	13.2	13.4	13.6	13.7	13.9	14.0	16.1
HZY12-26	18.1	20.3	21.3	22.0	21.2	22.0	22.4	22.7	22.9	23.4	25.9
HZY12-33	21.1	22.0	23.2	24.2	25.0	26.0	27.0	27.3	27.6	28.8	31.8
HZY12-44	28.9	29.7	30.4	31.2	31.9	32.8	33.9	34.5	35.2	36.2	39.3
HZY12-55	35.2	37.4	39.1	40.3	41.4	42.5	43.4	44.7	45.9	51.4	
HZY12-70J	45.9	47.8	48.6	49.8	51.2	52.2	53.7	54.7	56.7	62.8	
HZY12-70	46.8	48.7	49.5	50.8	52.2	53.2	54.0	54.8	55.8	57.8	64.1
HZY12-80	53.8	55.5	57.4	59.3	61.0	62.6	63.3	64.6	66.6	73.8	
HZY12-90	60.8	64.0	66.2	67.8	69.3	70.6	71.6	72.6	73.8	76.0	
HZY12-100	63.5	66.6	68.9	70.5	73.4	75.3	77.0	78.4	79.7	82.0	
HZY12-110	72.2	75.3	78.0	80.6	84.6	86.8	88.4	90.2	90.8	93.2	
HZY12-120	82.7	86.2	87.9	90.1	91.9	94.7	98	100	101	104	
HZY12-135	96.3	99	100	101	104	106	108	110	112	115	
HZY12-150	102	105	108	111	115	118	120	123	125	127	
HZY12-160	116	120	123	127	132	137	139	141	142	145	
HZY12-200	138	144	150	153	155	158	162	164	167	172	
HZY12-230	152	160	167	173	180	185	188	191	196	200	
HZY6-110	73.7	76.9	79.6	82.2	86.3	88.6	90.1	92.0	92.6	95.1	
HZY6-160	120	125	128	132	137	142	145	146	148	151	
HZY6-200	138	144	150	153	155	158	162	164	167	172	

Battery Model	Time in Hours - Amps to 1.70 VPC										
	2	3	4	5	6	7	8	9	10	12	20
HZY6-7.5	2.67	1.85	1.44	1.18	1.00	0.88	0.79	0.71	0.66	0.57	0.40
HZY6-10	3.58	2.50	1.93	1.59	1.36	1.19	1.06	0.96	0.88	0.76	0.52
HZY6-12	4.38	3.08	2.39	1.97	1.68	1.48	1.34	1.22	1.12	0.97	0.66
HZY12-7.5	2.67	1.85</td									

Battery Model	Time in Minutes - Watts per cell to 1.85 VPC													
	5	10	15	20	25	30	35	40	45	50	60	90	120	180
HZY6-7.5	26.9	20.3	16.7	14.4	12.4	10.9	9.81	8.93	8.24	7.64	6.64	5.21	4.18	2.92
HZY6-10	38.3	28.9	23.1	20.0	17.3	15.2	13.6	12.4	11.4	10.6	9.7	7.04	5.60	3.95
HZY6-12	46.5	35.0	27.9	23.7	20.5	18.1	16.2	14.7	13.7	12.8	11.3	8.52	6.86	4.86
HZY12-7.5	26.9	20.3	16.7	14.4	12.4	10.9	9.81	8.93	8.24	7.64	6.64	5.21	4.18	2.92
HZY12-12	46.5	35.0	27.9	23.7	20.5	18.1	16.2	14.7	13.7	12.8	11.3	8.52	6.86	4.86
HZY12-18	70.8	53.8	45.1	38.7	33.9	30.2	27.1	24.5	22.4	20.6	18.1	13.9	11.2	8.14
HZY12-26	120	89.8	73.3	62.2	54.2	48.3	43.6	39.5	36.4	33.6	29.6	21.8	17.7	13.4
HZY12-33	147	114	91.6	76.5	67.1	60.1	53.9	49.3	45.1	41.8	35.9	25.6	19.8	13.7
HZY12-44	180	148	121	102	88.5	78.2	70.8	64.4	59.4	55.0	48.1	34.3	26.8	18.6
HZY12-55	217	179	147	122	104	91.7	83.4	76.7	71.4	66.9	58.8	42.6	33.3	23.5
HZY12-70J	251	206	175	153	133	120	110	102	95.0	90.0	79.7	56.6	43.5	30.1
HZY12-70	256	210	178	156	136	123	112	104	97	91.8	81.3	57.8	44.4	30.7
HZY12-80	281	223	186	164	147	132	122	115	107	102	90.2	65.8	51.1	35.1
HZY12-90	314	252	213	186	165	150	137	126	117	109	98	72.5	57.4	40.5
HZY12-100	346	284	242	210	185	167	152	141	131	123	109	78.5	61.7	43.7
HZY12-110	378	315	266	233	207	189	170	156	142	131	115	85.7	67.9	47.8
HZY12-120	405	340	291	254	230	208	189	176	161	149	133	98	77.0	54.3
HZY12-135	393	326	301	276	256	235	218	203	189	177	156	114	89.5	61.2
HZY12-150	434	385	337	305	277	256	235	217	201	186	165	123	95.6	66.2
HZY12-160	447	397	355	321	299	275	252	234	218	203	184	136	108	75.5
HZY12-200	497	444	394	356	326	306	287	269	252	237	212	155	123	88.0
HZY12-230	550	486	425	390	363	340	319	302	281	268	246	181	144	102
HZY6-110	386	322	271	238	211	193	174	159	145	134	117	87.4	69.2	48.8
HZY6-160	465	413	370	333	311	286	262	243	226	211	191	141	112	78.5
HZY6-200	497	444	394	356	326	306	287	269	252	237	212	155	123	88.0

Battery Model	Time in Hours Watts per cell to 1.85 VPC												
	4	5	6	7	8	9	10	12	20				
HZY6-7.5	2.28	1.89	1.60	1.42	1.27	1.15	1.07	0.92	0.66				
HZY6-10	3.07	2.54	2.19	1.92	1.71	1.55	1.43	1.24	0.87				
HZY6-12	3.79	3.14	2.70	2.38	2.16	1.97	1.82	1.58	1.10				
HZY12-7.5	2.28	1.89	1.60	1.42	1.27	1.15	1.07	0.92	0.66				
HZY12-12	3.79	3.14	2.70	2.38	2.16	1.97	1.82	1.58	1.10				
HZY12-18	6.34	5.25	4.45	3.90	3.47	3.12	2.88	2.42	1.67				
HZY12-26	10.59	8.78	6.94	6.16	5.51	4.97	4.54	3.90	2.60				
HZY12-33	10.9	9.16	7.97	7.07	6.44	5.81	5.34	4.65	3.11				
HZY12-44	14.2	11.8	10.1	8.84	8.02	7.34	6.75	5.80	3.79				
HZY12-55	18.4	15.3	13.1	11.6	10.4	9.36	8.57	7.35	4.96				
HZY12-70J	23.2	19.0	16.4	14.4	12.8	11.7	10.7	9.16	6.12				
HZY12-70	23.7	19.4	16.7	14.7	13.1	11.9	10.9	9.34	6.25				
HZY12-80	27.5	22.8	19.5	17.2	15.2	13.6	12.4	10.7	7.11				
HZY12-90	31.5	25.8	22.0	19.2	17.1	15.4	14.1	12.2	8.07				
HZY12-100	34.3	28.5	24.4	21.6	19.3	17.5	15.9	13.7	8.94				
HZY12-110	37.1	30.5	26.6	23.8	21.2	19.1	17.4	14.9	10.0				
HZY12-120	41.6	34.2	29.3	25.8	23.4	21.2	19.4	16.7	10.9				
HZY12-135	46.8	38.4	32.6	28.8	25.9	23.4	21.4	18.4	12.0				
HZY12-150	51.5	42.5	36.6	32.3	28.9	26.3	24.0	20.5	13.5				
HZY12-160	59.1	48.8	41.8	37.1	33.0	29.7	27.3	23.3	15.0				
HZY12-200	69.5	57.2	49.1	43.0	38.5	34.9	32.1	27.5	18.1				
HZY12-230	79.9	66.4	57.5	50.4	44.9	40.8	37.5	32.1	20.9				
HZY6-110	37.9	31.2	27.1	24.3	21.6	19.5	17.8	15.2	10.2				
HZY6-160	61.5	50.8	43.5	38.6	34.3	30.9	28.4	24.2	15.6				
HZY6-200	69.5	57.2	49.1	43.0	38.5	34.9	32.1	27.5	18.1				

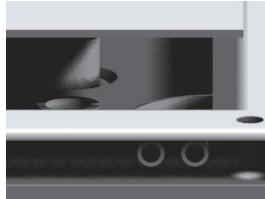
Battery Model	Time in Minutes - Watts per cell to 1.80VPC													
	5	10	15	20	25	30	35	40	45	50	60	90	120	180
HZY6-7.5	31.1	24.0	19.9	17.3	14.9	13.2	11.9	10.8	10.0	9.33	8.15	6.39	5.13	3.58
HZY6-10	44.2	34.2	27.6	23.9	20.9	18.4	16.5	15.1	13.9	12.9	11.4	8.63	6.88	4.84
HZY6-12	53.7	41.4	33.3	28.4	24.7	21.9	19.6	17.9	16.6	15.6	13.8	10.4	8.42	5.96
HZY12-7.5	31.1	24.0	19.9	17.3	14.9	13.2	11.9	10.8	10.0	9.33	8.15	6.39	5.13	3.58
HZY12-12	53.7	41.4	33.3	28.4	24.7	21.9	19.6	17.9	16.6	15.6	13.8	10.4	8.42	5.96
HZY12-18	78.6	56.9	47.4	40.7	35.0	30.9	27.5	24.9	22.7	20.9	18.4	14.2	11.4	8.23
HZY12-26	126	93	75.7	63.3	55.3	49.2	44.4	40.2	37.1	34.2	30.0	22.0	17.8	13.4
HZY12-33	161	122	94.4	80.5	69.4	61.5	55.7	50.2	46.2	42.7	37.0	26.1	20.2	14.1
HZY12-44	192	161	131	109	93.9	82.3	74.0	66.7	61.0	56.4	49.3	35.1	27.6	19.0
HZY12-55	237	204	164	131	111	97	87.6	80.0	74.4	68.7	60.5	43.1	33.6	24.0
HZY12-70J	275	233	193	162	139	124	113	104	99	92.7	79.9	56.5	43.8	30.6
HZY12-70	281	238	197	165	142	127	116	106	101	94.6	81.5	57.7	44.7	31.2
HZY12-80	294	250	212	182	158	141	131	121	114	106	93.7	66.7	51.6	35.6
HZY12-90	355	306	254	217	185	163	146	133	123	114	101	73.7	58.0	41.1
HZY12-100	416	327	267	227	196	175	159	146	137	127	112	80.1	62.9	44.5
HZY12-110	468	373	301	254	226	201	179	164	151	138	120	87.1	69.0	48.5
HZY12-120	495	401	327	280	245	220	199	183	170	157	130	78.8	55.1	41.1
HZY12-135	479	370	325	291	265	243	225	209	194	182	160	117	91.5	63.1
HZY12-150	535	438	375	332	299	273	250	231	214	200	175	125	98	67.3
HZY12-160	595	491	409	363	326	299	279	258	240	221	195	140	111	76.8
HZY12-200	615	516	437	398	359	334	312	295	276	263	236	168	131	92.6
HZY12-230	647	541	462	428	390	362	338	314	299	283	254	184	146	103
HZY6-110	477	381	307	260	230	205	183	167	154	141	123	88.9	70.4	49.5
HZY6-160	606	500	425	378	33									

Battery Model	Time in Minutes - Watts per cell to 1.70 VPC														
	5	10	15	20	25	30	35	40	45	50	60	90	120	180	
HZY6-7.5	35.3	25.9	21.1	18.1	15.5	13.6	12.2	11.1	10.2	9.40	8.18	6.40	5.12	3.57	
HZY6-10	50.1	36.9	29.2	25.1	21.7	19.0	17.0	15.5	14.2	13.0	11.42	8.65	6.87	4.82	
HZY6-12	60.9	44.6	35.2	29.8	25.7	22.6	20.2	18.4	17.0	15.7	13.9	10.5	8.41	5.94	
HZY12-7.5	35.3	25.9	21.1	18.1	15.5	13.6	12.2	11.1	10.2	9.40	8.18	6.40	5.12	3.57	
HZY12-12	60.9	44.6	35.2	29.8	25.7	22.6	20.2	18.4	17.0	15.7	13.9	10.5	8.41	5.94	
HZY12-18	86.9	62.7	49.7	42.3	36.2	31.7	28.4	25.7	23.6	21.8	19.2	14.6	11.8	8.54	
HZY12-26	131	97	78.0	64.4	55.9	49.7	44.7	40.7	37.4	34.4	30.2	21.9	17.5	13.1	
HZY12-33	169	126	99	83.7	71.5	63.5	56.4	51.2	46.8	43.2	37.6	26.5	20.5	14.5	
HZY12-44	208	173	139	113	96	84.2	74.9	67.5	62.2	57.5	50.2	35.7	28.1	19.5	
HZY12-55	258	216	170	137	114	100	89.3	81.9	76.5	70.9	62.1	44.0	34.4	24.8	
HZY12-70J	304	264	212	176	150	133	119	109	101	94.3	81.9	57.9	44.7	31.0	
HZY12-70	310	269	216	180	153	136	122	111	103	96	83.6	59.1	45.6	31.6	
HZY12-80	331	288	243	205	174	154	138	127	119	111	97	68.1	52.6	36.3	
HZY12-90	396	327	267	228	193	168	150	137	127	118	104	75.6	60.2	42.5	
HZY12-100	459	362	283	236	204	180	164	150	140	130	114	81.8	65.1	45.3	
HZY12-110	496	397	321	272	236	206	185	168	153	141	122	88.9	70.7	49.9	
HZY12-120	526	425	345	289	255	227	205	189	175	161	141	102	80.0	56.0	
HZY12-135	554	400	340	303	273	251	231	216	203	190	167	124	95.6	65.2	
HZY12-150	616	498	415	361	321	291	266	244	225	209	181	128	100	68.8	
HZY12-160	654	543	453	394	345	313	291	269	248	230	201	143	112	78.6	
HZY12-200	678	572	489	444	402	365	333	309	289	274	244	172	133	94.0	
HZY12-230	706	595	507	462	417	380	353	325	307	289	258	188	148	104	
HZY6-110	505	405	327	277	241	211	189	171	156	144	124	90.7	72.1	50.9	
HZY6-160	667	554	462	410	358	325	302	280	258	239	209	149	117	81.8	
HZY6-200	678	572	489	444	402	365	333	309	289	274	244	172	133	94.0	

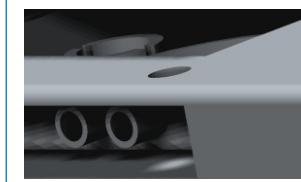
Battery Model	Time in HoursWatts per cell to 1.70 VPC										
	4	5	6	7	8	9	10	12	20		
HZY6-7.5	2.78	2.30	1.95	1.72	1.54	1.39	1.29	1.11	0.78		
HZY6-10	3.74	3.09	2.66	2.32	2.07	1.88	1.73	1.50	1.03		
HZY6-12	4.62	3.83	3.28	2.89	2.62	2.39	2.21	1.91	1.30		
HZY12-7.5	2.78	2.30	1.95	1.72	1.54	1.39	1.29	1.11	0.78		
HZY12-12	4.62	3.83	3.28	2.89	2.62	2.39	2.21	1.91	1.30		
HZY12-18	6.70	5.56	4.71	4.10	3.65	3.29	3.01	2.54			
HZY12-26	10.4	8.63	7.05	6.23	5.57	5.03	4.59	3.90	2.59		
HZY12-33	11.6	9.7	8.37	7.44	6.77	6.11	5.55	4.82	3.19		
HZY12-44	15.0	12.4	10.7	9.40	8.51	7.71	7.13	6.12	4.00		
HZY12-55	19.5	16.2	13.9	12.1	10.8	9.8	9.00	7.75	5.23		
HZY12-70J	23.9	19.8	17.0	14.9	13.3	12.0	11.1	9.52	6.35		
HZY12-70	24.4	20.2	17.4	15.2	13.5	12.2	11.3	9.7	6.48		
HZY12-80	28.2	23.4	20.2	17.7	15.8	14.2	13.1	11.3	7.50		
HZY12-90	33.1	27.1	23.2	20.2	18.0	16.2	14.9	12.8	8.51		
HZY12-100	35.5	29.4	25.5	22.5	20.1	18.3	16.8	14.4	9.43		
HZY12-110	39.0	32.3	28.2	25.0	22.3	20.1	18.4	15.8	10.5		
HZY12-120	43.3	35.8	30.8	27.2	24.6	22.3	20.5	17.6	11.5		
HZY12-135	50.0	40.7	34.7	30.3	27.2	24.6	22.6	19.4	12.6		
HZY12-150	53.8	44.6	38.5	33.8	30.4	27.5	25.2	21.5	14.2		
HZY12-160	62.0	51.3	44.3	39.2	35.0	31.5	28.6	24.6	15.8		
HZY12-200	73.3	60.5	51.7	45.2	40.4	36.7	33.9	29.1	19.1		
HZY12-230	82.5	68.7	59.6	52.8	47.2	42.7	39.3	33.8	22.0		
HZY6-110	39.8	33.0	28.8	25.5	22.7	20.5	18.7	16.1	10.7		
HZY6-160	64.5	53.4	46.1	40.7	36.4	32.7	29.8	25.5	16.4		
HZY6-200	73.3	60.5	51.7	45.2	40.4	36.7	33.9	29.1	19.1		

Battery Model	Time in Minutes - Watts per cell to 1.65 VPC														
	5	10	15	20	25	30	35	40	45	50	60	90	120	180	
HZY6-7.5	36.3	26.4	21.3	18.2	15.5	13.6	12.2	11.1	10.2	9.46	8.18	6.40	5.12	3.56	
HZY6-10	51.6	37.5	29.5	25.2	21.7	19.0	17.0	15.5	14.2	13.1	11.4	8.64	6.86	4.82	
HZY6-12	62.7	45.4	35.6	30.0	25.7	22.6	20.2	18.4	17.0	15.8	13.9	10.4	8.40	5.94	
HZY12-7.5	36.3	26.4	21.3	18.2	15.5	13.6	12.2	11.1	10.2	9.46	8.18	6.40	5.12	3.56	
HZY12-12	62.7	45.4	35.6	30.0	25.7	22.6	20.2	18.4	17.0	15.8	13.9	10.4	8.40	5.94	
HZY12-18	88.2	63.4	50.9	42.7	36.6	32.1	28.8	26.1	24.0	22.2	19.6	14.8	11.9	8.61	
HZY12-26	137	99	79.0	65.3	56.6	50.4	45.3	41.2	37.9	34.9	30.5	22.0	17.6	13.2	
HZY12-33	171	128	99	84.5	72.2	63.9	56.9	51.5	47.2	43.7	37.8	26.8	20.7	14.6	
HZY12-44	211	175	141	114	97	84.8	75.4	68.2	62.7	57.8	50.5	36.0	28.2	19.6	
HZY12-55	265	221	174	140	117	101	90.2	82.8	76.9	71.5	62.4	44.5	34.8	24.9	
HZY12-70J	315	272	220	181	155	134	120	110	102	95.8	82.8	58.5	45.0	31.1	
HZY12-70	321	277	225	185	158	137	123	112	104	98	84.5	59.7	46.0	31.8	
HZY12-80	363	301	252	209	178	154	140	128	120	113	98	68.6	52.8	36.4	
HZY12-90	408	333	275	231	195	170	152	138	128	120	105	77.0	60.7	42.8	
HZY12-100	482	369	289	240	206	182	164	152	140	131	115	83.1	65.6	45.5	
HZY12-110	521	404	324	274	238	209	187	170	155	143	123	89.8	71.0	50.0	
HZY12-120	549	431	348	293	258	229	207	190	177	162	143	103	80.4	56.2	
HZY12-135	576	429	360	316	282	259	239	223	209	195	171	97	66.0		
HZY12-150	639	522	432	373	329	296	271	249	228	212	183	130	100	69.0	
HZY12-160	670	549	459	398	347	314	292	271	250	231	202	145	113	79.1	
HZY12-200	696	587	509	457	410	366	336	311	295	275	248	175	135	94.7	
HZY12-230	726	602	520	470	420	382	356	330	310	292	261	192	150	104	
HZY6-110	531	412	331	280	243	213	190	173	159	146	125	92	72.4	51.0	
HZY6-160	684	560	469	414	361	327	304	282	260	240	210	151	118	82.3	
HZY6-200	696	587	509	457	410	366	336	311	295	275	248	175	135	94.7	

Battery Model	Time in Minutes - Watts per cell to 1.60 VPC														
5	10	<th													

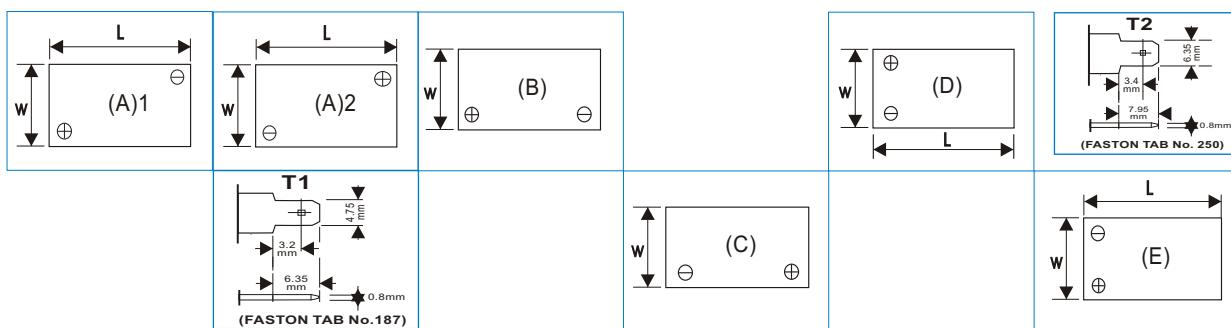


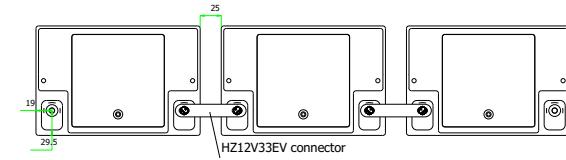
Central Gassing - Haze produce some models with a integral central gassing system. This system is a useful feature when batteries are installed in an IP66 cabinet. Sealing prevents any escaping gas from exiting the enclosure. Central gassing allows a tube carrying the emissions to pass through a seal to atmosphere. Haze are adding this feature to a number of sizes, if you require this feature please contact us for an up-to-date list of models included.



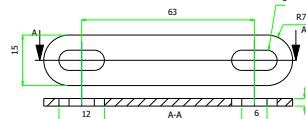
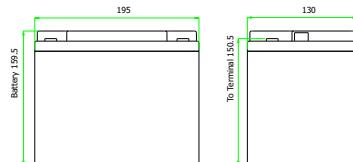
Battery Model	Qty Per Box	Dimensions (mm) & weight (Kg)				Dimensions (Inches) & weight (Lbs)				Terminal Details	BCI Group Size	Internal Resistance mOhms	Maximum Charge Current	CCA at 0 °C	Short Circuit Amps	
		Length	Width	Height	Weight	Length	Width	Height	Weight							
HZY6-7.5	10	150	34	96 (101)	1.3	5.91	1.34	3.7 (3.9)	2.8	B-T1	—	13	1.5	NA	275	
HZY6-10	10	151	50	97 (101)	1.9	5.94	1.97	3.7 (3.9)	4.2	B-T1	—	10	2	NA	325	
HZY6-12	10	151	50	98 (101)	2.0	5.94	1.97	3.7 (3.9)	4.4	B-T2	—	10	2.4	NA	500	
HZY12-7.5	8	151	65	99 (101)	2.5	5.94	2.56	3.7 (3.9)	5.5	D-T1	—	28	1.5	NA	275	
HZY12-12	4	150	97	100 (101)	4.0	5.91	3.82	3.7 (3.9)	8.8	D-T2	—	20	2.4	NA	500	
HZY12-18	2	181	76	167	5.9	7.13	2.99	6.57	13.0	C - M5	—	12	4.5	270	700	
HZY12-26	1	166	176	126	8.8	6.54	6.93	4.96	19.4	C - M5	—	9.5	6.5	300	900	
HZY12-33	1	195	130	160	10.9	7.68	5.12	6.30	24.1	B - M6	U1	8.5	8	320	1100	
HZY12-44	1	197	165	170	14.0	7.76	6.50	6.69	30.9	C - M6	—	7.5	11	350	1400	
HZY12-55	1	228	137	207	17.5	8.98	5.39	8.15	38.7	B - M6	22NF	6.5	14	380	1700	
HZY12-70J	1	350	167	179	22.1	13.78	6.57	7.05	48.8	Flag 1/4"	C - M6	—	5	18	550	2100
HZY12-70	1	259	168	208	21.5	10.20	6.61	8.19	47.5	B - M6	24	5	18	550	2100	
HZY12-80	1	259	168	208	23.3	10.20	6.61	8.19	51.5	B - M6	24	5	20	620	2400	
HZY12-90	1	305	168	208	27	12.01	6.61	8.19	59.7	B - M6	27	4	22	680	2650	
HZY12-100	1	305	168	208	28.4	12.01	6.61	8.19	62.8	B - M6	27	5	25	780	2900	
HZY12-110	1	332	174	213	32.2	13.07	6.85	8.39	71.2	B - M6	31	4	27	960	3000	
HZY12-120	1	408	176	227	35.4	16.06	6.93	8.94	78.2	B - M6	—	3	30	1020	3300	
HZY12-135	1	340	173	280	39.8	13.39	6.81	11.02	88.0	C - M6	—	2.5	35	1160	3750	
HZY12-150	1	482	170	242	44.3	18.98	6.69	9.53	97.8	B - M6	—	2	38	1300	4200	
HZY12-160	1	530	209	214	57.4	20.87	8.23	8.43	126.9	E - M6	4D	2	40	1440	4700	
HZY12-200	1	520	240	220	66.0	20.47	9.45	8.66	145.9	E - M8	—	<2	50	1670	5400	
HZY12-230	1	521	269	203	71.0	20.51	10.59	7.99	156.9	E - M8	8D	<2	57	1870	5900	
HZY6-110	1	193	168	205	16.0	7.60	6.61	8.07	35.4	A1 - M6	—	4	27	1010	3200	
HZY6-160	1	298	171	226	26.0	11.73	6.73	8.90	57.5	A2 - M6	—	2	40	1290	4600	
HZY6-200	1	318	170	225	31.0	12.52	6.69	8.86	68.5	A2 - M8	—	<2	50	1600	5000	

Terminal Layout details





HZY12-33EV

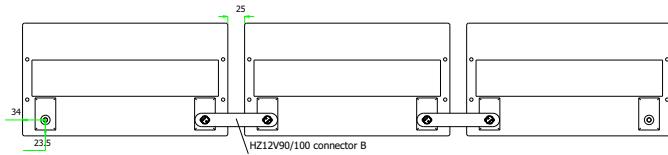


Battery installations have many variables : space available, autonomy times, load carrying requirements etc.

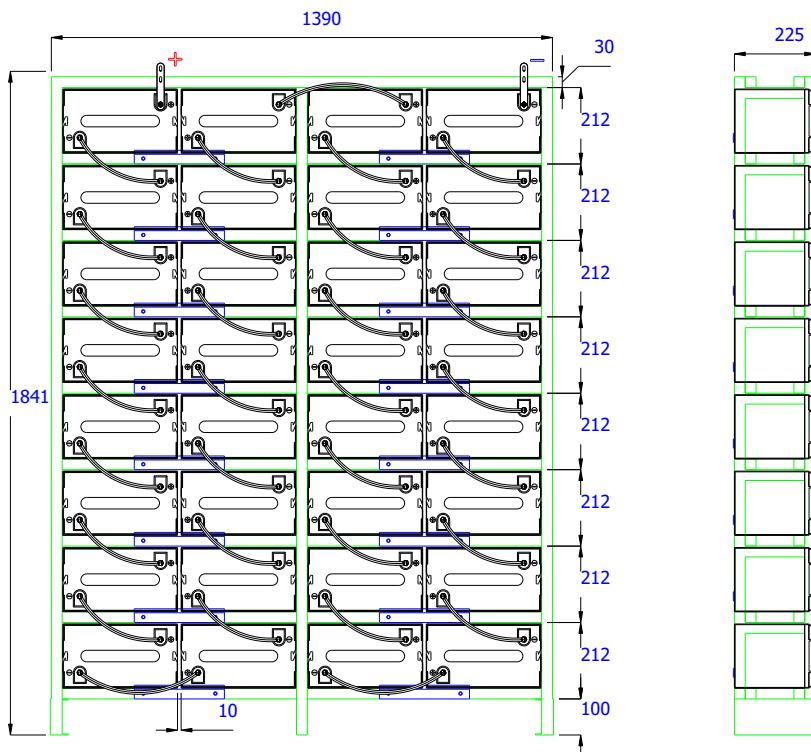
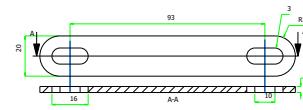
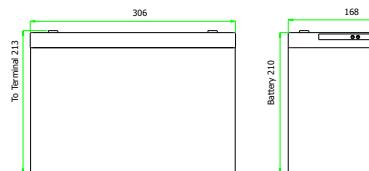
Haze Engineering department is at the customers disposal to find the best solution, provide dimensioned layout drawings and wiring diagrams.

A tailor made solution to meet the customers requirements.

All drawings are submitted for customer approval to ensure trouble free installation.



HZY/B12-90/100



Racking is available to suit available space and required configuration.

Special cables and / or standard connectors can be provided on request along with wiring diagrams.

A range of terminal covers are available to cover large and small batteries and cables or connectors.

The example rack shown is for HZB/Y6-200.