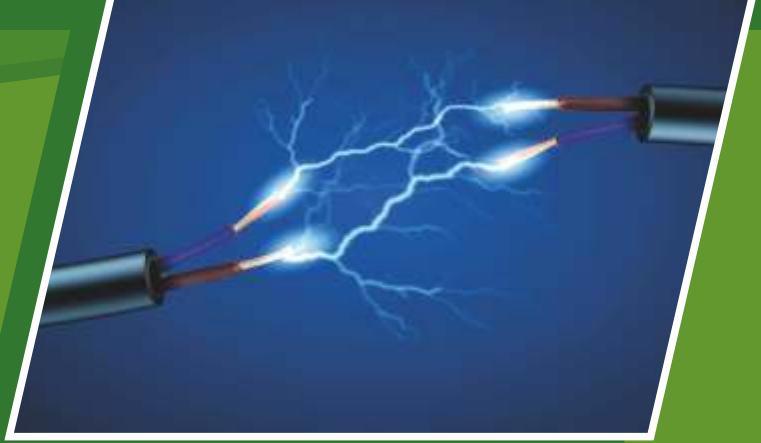


*Herkese Yetecek Kadar
Enerjimiz Var!*



FZA
BATTERY

KURUMSAL

1977 yılında Akümülatör plakaları ve malzemesi üretmek üzere, Kayseri'de küçük bir atölyede kurulan Aküsan A.Ş. bugün 9.000 m² si kapalı 12.000 m² lik alanda hizmet veren uluslararası bir markaya dönüşmüştür.

1981 yılında ebonit kutulu ziftli akümülatör üretimi ile Ford Traktör Fabrikasının en önemli tedarikçilerinden biri olma başarısını göstermiştir. 1983 yılında Doğu Sanayi Bölgesine taşıdığı fabrikasıyla sektörde ilerleme yolunda önemli adım atmıştır. 1986 yılında az bakımlı plastik kutulu akü üretimiyle sektöre yeni bir ivme kazandırmıştır.

Kuruluşumuz bugüne kadar müşteri memnuniyeti ve üstün kaliteyi kendisine prensip edinip hiçbir zaman kaliteden ödün vermemiştir. Bu çerçevede 1988 yılında aldığı "TSE 1353 Kalite Sertifikası" ve 2004 yılında aldığı "ISO 9001:2000 Kalite Sistem Sertifikası" ile kalitesini tescillemiş ve ülkemizin önemli akümülatör üreticilerinden biri olduğunu ispatlamıştır. 2006 yılında aldığı "TS EN ISO 14001 Çevre Yönetim Sistem Sertifikası" ile de çevreye ve doğaya karşı olan duyarlılığını ispatlamıştır.

Yenilikçi yapısıyla sektörde ilerleyen firmamız 2008 yılından itibaren de Türkiye'nin ilk ve tek VRLA Jel Akü üreticisi olarak yoluna devam etmektedir. Asya ve Feza Starter tip akümülatörler ve FZA JEL AKÜ ticari markalarımızla TSE ve Alman Menşeli Unicert - ISO 9001:2008 kalite belgelerimiz çerçevesinde imalat yapmaktayız. Yurtiçi 350'yi aşkın bayimiz ile hizmete devam ediyoruz. Yurtdışında ise 15'in üzerinde ülkeye ihracat gerçekleştirmekteyiz, "Yunanistan, Mısır, Lübnan, Nijerya, Türkmenistan, Polonya" bunlardan birkaçıdır. Bu çerçevede yaptığı ihracatla ülke ekonomisine katkıda bulunan Aküsan A.Ş. teknolojik gelişmeleri yakından izleyerek gücüne güç katmak için çalışmalarını titizlikle sürdürmektedir.

Toplam kalite yönetimi ve sürekli gelişim anlayışına verdiği önemden dolayı yatırımlarına aralıksız devam eden Aküsan A.Ş. yıllık 500.000 akümülatör üretim kapasitesi ile sektörde adından söz edilen bir firma olma başarısını göstermiştir.

Çevre Politikamız

Çevreye karşı daha duyarlı olmak için sürekli gelişimi sağlamak; şirketimiz yönetimi ve personeli için bir önceliktir.

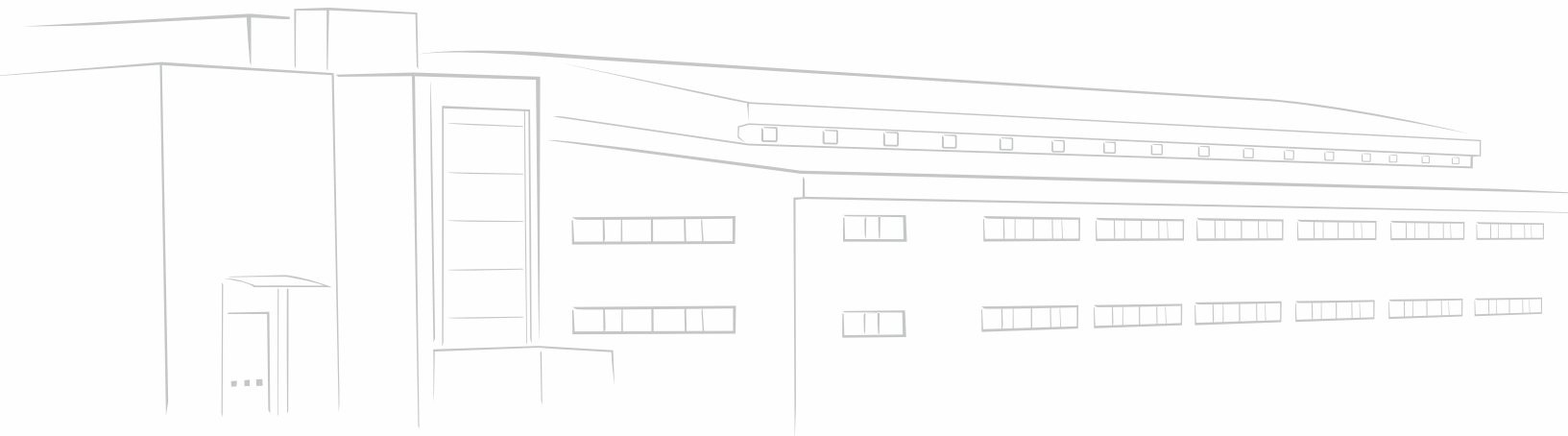
Şirketimiz ; ISO 14001 standardına uygun olarak ,çevresel hedeflere ulaşmak için tüm mali, idari ,teknik donanım kaynaklarının tedarik edilerek Çevre Yönetim Sisteminin sürekli gelişimini sağlamayı taahhüt eder.

Kalite Politikamız

Ana politikamız müşterilerimizin beklentilerini en üst seviyede karşılamaktır.

Bunu gerçekleştirmek için;

- Ürün ve çevre ile ilgili olarak ulusal/uluslararası yasal yükümlülükleri ve kalite standartlarının gereklerini yerine getirmek,
- Tedarikçilerimizden müşterilerimize kadar olan süreçte; kalite, maliyetler ve teknolojideki iyileşmeyi sürekli hale getirmek,
- Süreçleri yalınlaştırmak ve iyileştirmek,
- Müşterilerimizi doğru anlamak ve beklentilerini fazlası ile karşılamak,
- Ürün ve hizmette tam güvenilirliği sağlamak ve sürekli kılmak,
- Enformasyon ve üretim teknolojilerini izleyerek kendi teknolojimizi oluşturmak,
- Tedarikçi kalitemizi yükseltmek için çalışmalar yapmak,
- Çalışanların motivasyonlarını arttırarak şirket hedefleri ile bütünleşmelerini sağlamak,
- Müşterilerimizi, çalışanlarımızı ve çevreyi olası risklerden korumaktır.



CORPORATE

Akusan Inc. was established in 1976 in Kayseri / TURKEY. Akusan Inc. was founded in a small workshop to produce starter battery plates, and today has become an international brand, occupying a total area of 12.000 m².

In 1981, Akusan started to produce ebonite type starter battery and its first batteries are used as OEM battery of Turkish Ford Factory. Since 1983, Akusan Inc. is using its modern plant to produce battery components, in "East Industrial Zone" of Kayseri, has accelerated its growth in certain steps to be an international firm and a demanded brand.

Trained personnel structure, high-standard technology and modern manufacturing understanding lie beneath the high-quality of Akusan Inc. Our company has always given great importance to the quality of product. Most important principle of our company is the customer satisfaction with high-quality product. Based on this principle; it got the "TSE 1353 Quality Certificate" in 1988 and also in 2004 our company earned another quality certificate, which is "ISO 9001:2000 Quality Management System". Our company proved its quality in battery sector with these certificates. And also, it has showed its sensitivity to nature and environment by getting the certificate; "TSE EN ISO 14000 Environmental Management Certificate".

Akusan INC., which endeavors to develop itself constantly and with environmental and technological improvement to compete with the world's technology, has continued to its technological investments with Gel Battery manufacturing since 2008 as the first and only in TURKEY. AKUSAN has achieved to produce GEL Batteries within the brand name FZA GEL BATTERY.

Till now we have more than 350 retail-sales point in domestic market, also we are exporting gel battery more than 15 countries in all over the world. (Poland, Jordan, Greece, Iraq, Cameroon, Afghanistan etc.)

Environmental Policy

Being more sensitive about environment is precedence for our company's management and employee.

The management of our company undertake that all financial, administrative and technical resources will be supplied in order to provide ongoing improvement in Environment Management System as appropriate ISO 14001 Standards.

Quality Policy

Our main policy is to respond to our customers needs at top level.

To realize this;

- To use every opportunity for improvement
- To constitute a participation and positive company culture; with high motivated employee.
- To provide better working conditions to protect environment and to respect all livings.
- To respect and obey the quality standards delivery times of our customers in the way of our company goods.
- To form our own technology by following up- to- date informations and technologies.
- To see all our suppliers as a part of our quality system and to make them improve as the same way we do.



FZA 1.2-4

4V 1.2 AH



FZA 1.2-4



Physical Specification

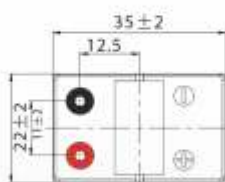
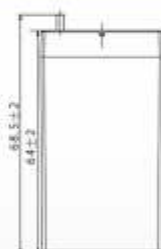
Part Number:	FZA 1.2-4
Length:	35 ± 2 mm (1.38 inches)
Width:	22 ± 2 mm (0.87 inches)
Container Height:	92 ± 2 mm (3.62 inches)
Total Height (with terminal):	100 ± 2 mm (3.94 inches)
Approx Weight:	Approx 0.15kg (0.33lbs)

Specifications

Terminal Type	Normal Voltage	4V
	Normal Capacity (20HR)	1.2AH
	Standard Terminal	\
Container Material	Optional Terminal	-
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	1.20 AH/0.600A	(20hr, 1.80V/cell, 25°C / 77°F)
	1.12 AH/0.112A	(10hr, 1.80V/cell, 25°C / 77°F)
	1.02 AH/0.204A	(5hr, 1.75V/cell, 25°C / 77°F)
	0.918 AH/0.306A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	0.754 AH/0.754A	(1hr, 1.60V/cell, 25°C / 77°F)
	18A (5s)	
Internal Resistance	Approx 60mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.36A. Voltage 4.8V ~ 5.0V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 4.5V ~ 4.6V at 25°C (77°F) Temp. Coefficient -6mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

Terminal



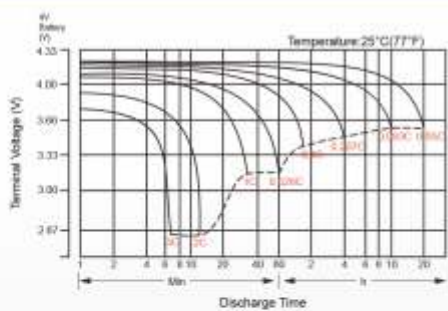
Constant Current Discharge (Amperes) at 20°C

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	2.29	1.75	1.45	1.26	0.97	0.716	0.603	0.357	0.279	0.227	0.185	0.161	0.130	0.108	0.059
1.80V/cell	3.07	2.24	1.78	1.49	1.15	0.833	0.676	0.390	0.300	0.242	0.199	0.172	0.137	0.112	0.060
1.75V/cell	3.46	2.46	1.92	1.60	1.19	0.864	0.707	0.404	0.306	0.248	0.204	0.177	0.140	0.115	0.061
1.70V/cell	3.81	2.69	2.05	1.68	1.24	0.889	0.729	0.414	0.315	0.254	0.209	0.181	0.142	0.117	0.062
1.65V/cell	4.20	2.90	2.18	1.78	1.31	0.921	0.746	0.420	0.328	0.263	0.215	0.185	0.144	0.119	0.062
1.60V/cell	4.63	3.15	2.33	1.90	1.38	0.960	0.754	0.436	0.338	0.271	0.222	0.189	0.145	0.121	0.063

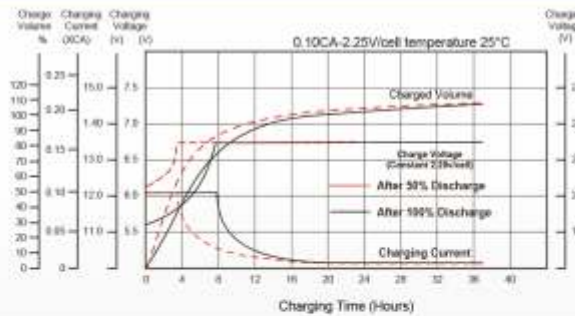
Constant Power Discharge (Watts) at 20°C

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	4.18	3.24	2.71	2.37	1.85	1.38	1.16	0.693	0.544	0.444	0.363	0.316	0.256	0.214	0.116
1.80V/cell	5.55	4.09	2.23	2.76	2.15	1.59	1.30	0.751	0.582	0.471	0.388	0.337	0.271	0.221	0.119
1.75V/cell	6.12	4.43	2.49	2.94	2.22	1.63	1.35	0.776	0.591	0.480	0.397	0.346	0.275	0.226	0.120
1.70V/cell	6.58	4.71	3.87	3.07	2.29	1.69	1.39	0.794	0.606	0.492	0.406	0.352	0.278	0.231	0.122
1.65V/cell	7.13	5.04	3.87	3.23	2.40	1.72	1.41	0.801	0.629	0.507	0.416	0.359	0.282	0.235	0.123
1.60V/cell	7.68	5.35	4.08	3.41	2.52	1.78	1.42	0.831	0.645	0.521	0.428	0.365	0.284	0.237	0.124

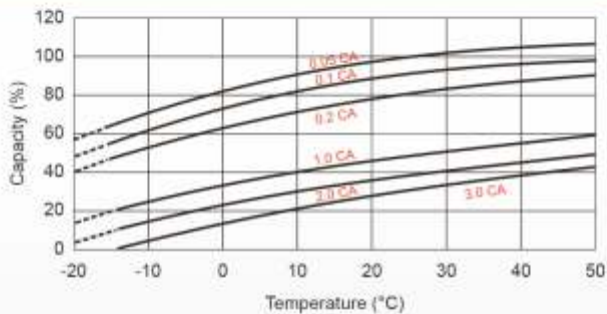
Discharge Characteristics



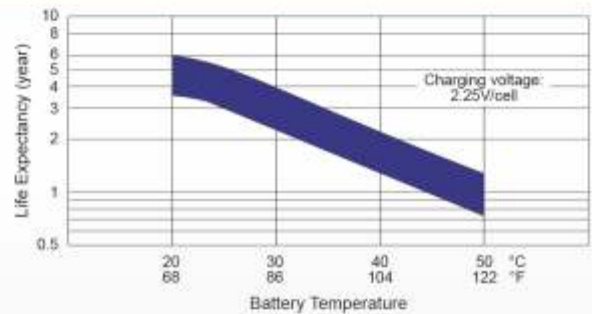
Float Charging Characteristics



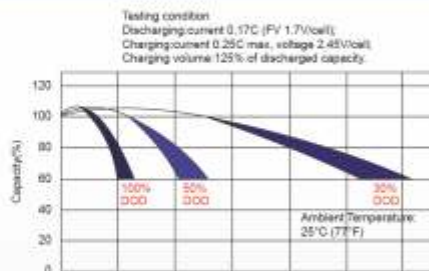
Temperature Effects in Relation to Battery Capacity



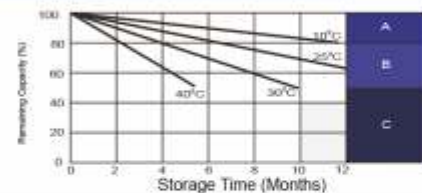
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required
(Control supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging was as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 26 hours at limited current 0.25CA and constant voltage 2.25V/cell.

FZA 4-4
4V 4AH



FZA 4-4



Physical Specification

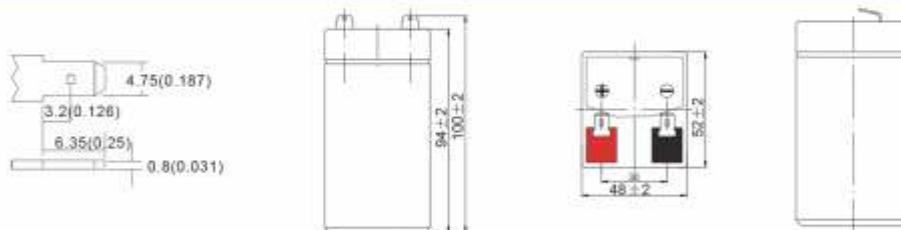
Part Number	FZA 4-4
Length	52.5 ± 2 mm
Width	48 ± 2 mm
Container Height	94 ± 2 mm
Total Height (with terminal)	100 ± 2 mm
Approx Weight	0.60 kg

Specifications

	Nominal Voltage	4V
	Nominal Capacity (20HR)	4AH
Terminal Type	Standard Terminal	F1
	Optional Terminal	F2
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	UL94:VO
Rated Capacity	20hr, 1.80V/cell, 25°C	4.50 AH/0.225A
	10hr, 1.80V/cell, 25°C	4.19 AH/0.419A
	5hr, 1.75V/cell, 25°C	3.85 AH/0.77A
	1hr, 1.60V/cell, 25°C	2.65 AH/2.65A
Max Discharge Current	67.5A (5s)	
Internal Resistance	15mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C
		Charge: 0 ~ 40°C
		Storage: -15 ~ 40°C
	Nominal Operating Temp. Range	25 ± 3°C
	Cycle Use	Initial Charging Current less than 1.35A. Voltage 4.8V ~ 5.0V Temp. Coefficient -10mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 4.5V ~ 4.6V Temp. Coefficient -6mV/°C
	Capacity affect by Temperature	40°C 103%
		25°C 100%
		0°C 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



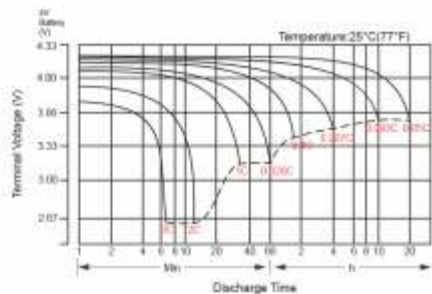
Constant Current Discharge (Amperes) at 20°C

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	8.57	6.58	5.45	4.71	3.64	2.68	2.26	1.34	1.05	0.85	0.69	0.60	0.486	0.406	0.223
1.80V/cell	11.5	8.41	6.59	5.57	4.30	3.12	2.53	1.46	1.13	0.91	0.75	0.65	0.515	0.419	0.225
1.75V/cell	13.0	9.24	7.19	5.99	4.46	3.24	2.65	1.51	1.15	0.93	0.77	0.66	0.524	0.430	0.227
1.70V/cell	14.3	10.1	7.68	6.30	4.65	3.37	2.74	1.55	1.18	0.95	0.78	0.68	0.532	0.438	0.231
1.65V/cell	15.7	10.9	8.17	6.69	4.90	3.45	2.80	1.58	1.23	0.99	0.81	0.69	0.540	0.447	0.234
1.60V/cell	17.4	11.8	8.73	7.13	5.18	3.60	2.83	1.64	1.27	1.02	0.83	0.71	0.545	0.452	0.236

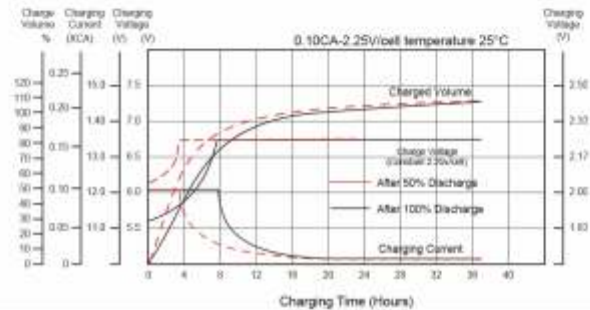
Constant Power Discharge (Watts) at 20°C

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	15.7	12.2	10.2	8.88	6.95	5.16	4.37	2.60	2.04	1.66	1.36	1.18	0.959	0.803	0.441
1.80V/cell	20.8	15.4	12.1	10.3	8.07	5.96	4.86	2.82	2.18	1.77	1.45	1.27	1.014	0.827	0.445
1.75V/cell	23.0	16.6	13.1	11.0	8.31	6.12	5.06	2.91	2.22	1.80	1.49	1.30	1.030	0.848	0.449
1.70V/cell	24.6	17.7	13.8	11.5	8.60	6.34	5.21	2.98	2.27	1.85	1.52	1.32	1.043	0.864	0.457
1.65V/cell	26.7	18.9	14.5	12.1	9.00	6.44	5.29	3.00	2.36	1.90	1.56	1.35	1.057	0.881	0.462
1.60V/cell	28.8	20.1	15.3	12.8	9.43	6.68	5.31	3.12	2.42	1.96	1.61	1.37	1.065	0.889	0.464

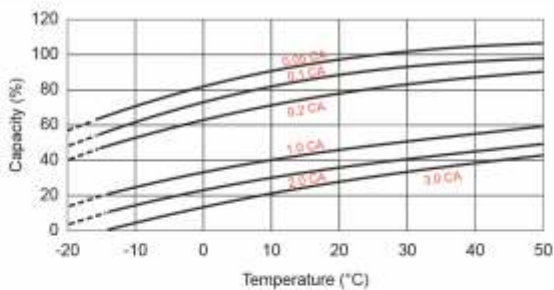
Discharge Characteristics



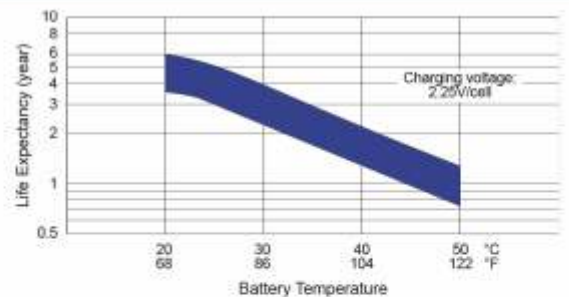
Float Charging Characteristics



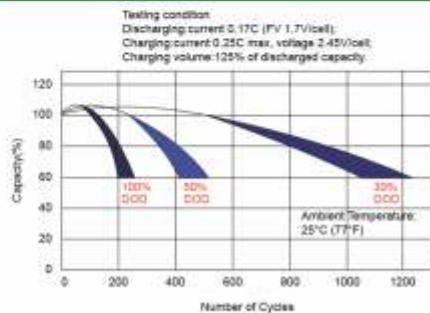
Temperature Effects in Relation to Battery Capacity



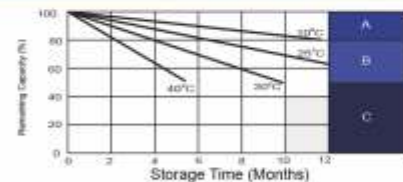
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required.
(Carryout supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
1. Charged for above 5 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 26 hours at limited current 0.25CA and constant voltage 2.25V/cell.
3. Charged for 6 ~ 10 hours at limited current 0.05 CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing till this is reached.

FZA 1.3-6

6V 1.3AH



FZA 1.3-6



Physical Specification

Part Number:	FZA 1.3-6
Length:	97 ± 2 mm (3.82 inches)
Width:	24 ± 2 mm (0.94 inches)
Container Height:	51.5 ± 2 mm (2.03 inches)
Total Height (with terminal):	57.5 ± 2 mm (2.26 inches)
Approx Weight:	Approx 0.29kg (0.639lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	1.3AH
	Standard Terminal	F1
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	UL94:VO
Rated Capacity	1.3 AH/0.060A	(20hr, 1.80V/cell, 25°C / 77°F)
	1.20 AH/0.112A	(10hr, 1.80V/cell, 25°C / 77°F)
	1.02 AH/0.204A	(5hr, 1.75V/cell, 25°C / 77°F)
	0.918 AH/0.306A	(3hr, 1.75V/cell, 25°C / 77°F)
	0.754 AH/0.754A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	18A (5s)	
Internal Resistance	Approx 65mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.36A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



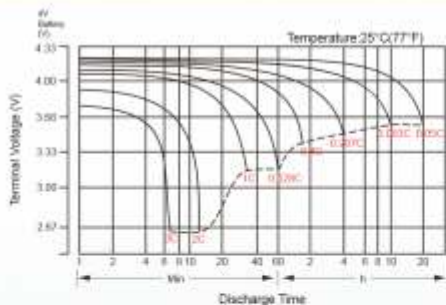
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	2.29	1.75	1.45	1.26	0.97	0.716	0.603	0.357	0.297	0.227	0.185	0.161	0.130	0.108	0.0594
1.80V/cell	3.07	2.24	1.76	1.49	1.15	0.833	0.676	0.390	0.300	0.242	0.199	0.172	0.137	0.112	0.0600
1.75V/cell	3.46	2.46	1.92	1.60	1.19	0.864	0.707	0.404	0.306	0.248	0.204	0.177	0.140	0.115	0.0606
1.70V/cell	3.81	2.69	2.05	1.68	1.24	0.899	0.729	0.414	0.315	0.254	0.209	0.181	0.142	0.117	0.0617
1.65V/cell	4.20	2.90	2.18	1.78	1.31	0.921	0.746	0.420	0.328	0.263	0.215	0.185	0.144	0.119	0.0625
1.60V/cell	4.63	3.15	2.33	1.90	1.38	0.960	0.754	0.438	0.338	0.271	0.222	0.189	0.145	0.121	0.0629

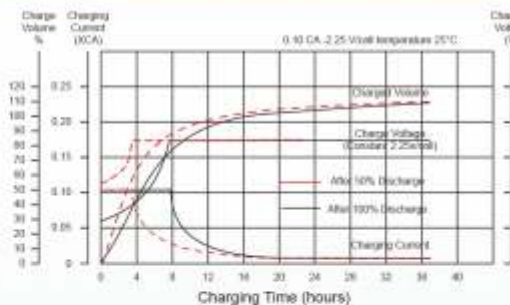
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	4.18	3.24	2.71	2.37	1.85	1.38	1.16	0.693	0.544	0.444	0.363	0.316	0.256	0.214	0.118
1.80V/cell	5.55	4.09	3.23	2.76	2.15	1.59	1.30	0.751	0.582	0.471	0.388	0.337	0.271	0.221	0.119
1.75V/cell	6.12	4.43	3.49	2.94	2.22	1.63	1.35	0.776	0.591	0.480	0.397	0.346	0.275	0.226	0.120
1.70V/cell	6.56	4.71	3.67	3.07	2.29	1.69	1.39	0.794	0.606	0.492	0.406	0.352	0.278	0.231	0.122
1.65V/cell	7.13	5.04	3.87	3.23	2.40	1.72	1.41	0.801	0.629	0.507	0.416	0.359	0.282	0.235	0.123
1.60V/cell	7.68	5.35	4.08	3.41	2.52	1.78	1.42	0.831	0.645	0.521	0.428	0.365	0.284	0.237	0.124

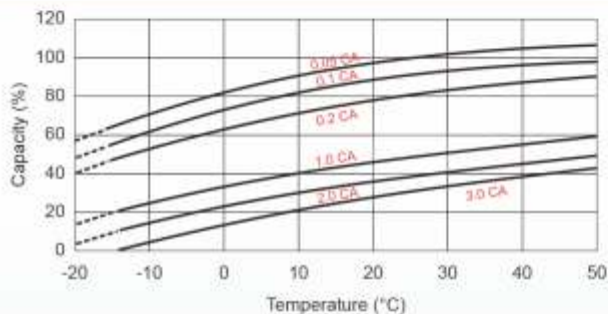
Discharge Characteristics



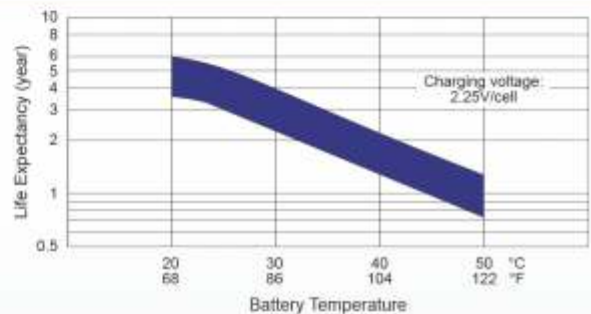
Float Charging Characteristics



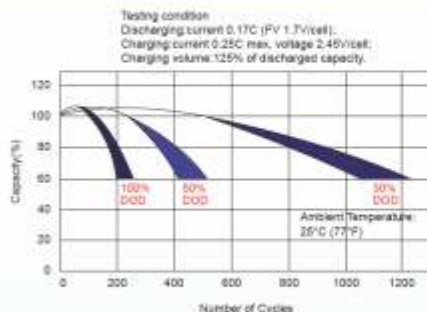
Temperature Effects in Relation to Battery Capacity



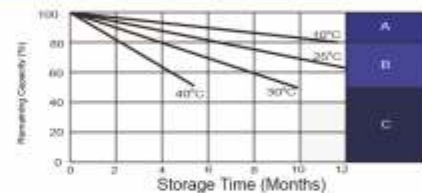
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required.
(Control supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell.
3. Charged for 6-18 hours at limited current 0.65 CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing 60-90 days without.

FZA 2.8-6T

6V 2.8AH



FZA 2.8-6T



Physical Specification

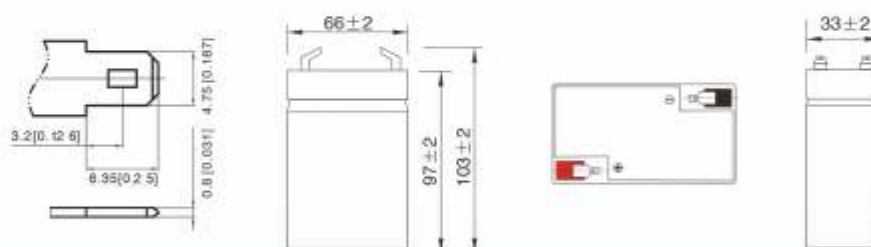
Part Number:	FZA 2.8-6T
Length:	66 ± 2 mm (2.60 inches)
Width:	33 ± 2 mm (1.30 inches)
Container Height:	97 ± 2 mm (3.82 inches)
Total Height (with terminal):	103 ± 2 mm (4.06 inches)
Approx Weight:	Approx 0.57kg (1.26lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	2.8AH
	Standard Terminal	F1
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	UL94:VO
Rated Capacity	2.80 AH/0.14A	(20hr, 1.80V/cell, 25°C / 77°F)
	2.60 AH/0.26A	(10hr, 1.80V/cell, 25°C / 77°F)
	2.40 AH/0.48A	(5hr, 1.75V/cell, 25°C / 77°F)
	2.13 AH/0.71A	(3hr, 1.75V/cell, 25°C / 77°F)
	1.76 AH/1.76A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	42A (5s)	
Internal Resistance	Approx 30mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.84A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



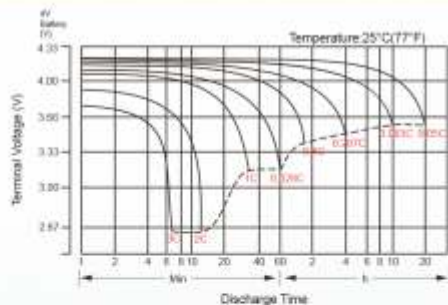
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	5.33	4.09	3.39	2.93	2.27	1.67	1.41	0.83	0.65	0.53	0.432	0.375	0.302	0.253	0.139
1.80V/cell	7.16	5.23	4.10	3.47	2.68	1.94	1.58	0.91	0.70	0.57	0.464	0.402	0.321	0.260	0.140
1.75V/cell	8.07	5.75	4.48	3.73	2.78	2.02	1.65	0.94	0.71	0.58	0.476	0.413	0.326	0.267	0.141
1.70V/cell	8.89	6.27	4.78	3.92	2.89	2.10	1.70	0.97	0.73	0.59	0.488	0.422	0.331	0.273	0.144
1.65V/cell	9.80	6.76	5.08	4.16	3.05	2.15	1.74	0.98	0.77	0.61	0.501	0.431	0.336	0.278	0.146
1.60V/cell	10.81	7.34	5.43	4.44	3.22	2.24	1.76	1.02	0.79	0.63	0.518	0.440	0.339	0.281	0.147

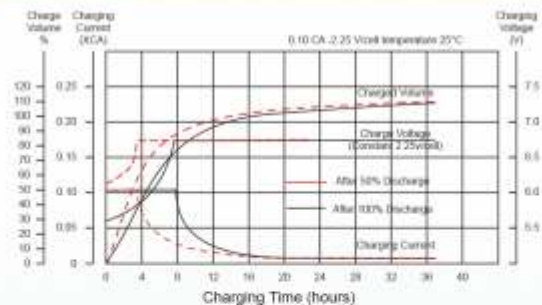
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	9.75	7.56	6.33	5.53	4.32	3.21	2.72	1.62	1.27	1.04	0.847	0.737	0.597	0.500	0.275
1.80V/cell	12.9	9.55	7.54	6.44	5.02	3.71	3.03	1.75	1.36	1.10	0.905	0.787	0.631	0.515	0.277
1.75V/cell	14.3	10.3	8.14	6.86	5.17	3.81	3.15	1.81	1.38	1.12	0.926	0.806	0.641	0.528	0.279
1.70V/cell	15.3	11.0	8.57	7.16	5.35	3.95	3.24	1.85	1.41	1.15	0.948	0.822	0.649	0.538	0.284
1.65V/cell	16.6	11.8	9.04	7.54	5.60	4.01	3.29	1.87	1.47	1.18	0.970	0.837	0.658	0.548	0.288
1.60V/cell	17.9	12.5	9.51	7.95	5.87	4.16	3.31	1.94	1.51	1.22	0.999	0.853	0.663	0.553	0.289

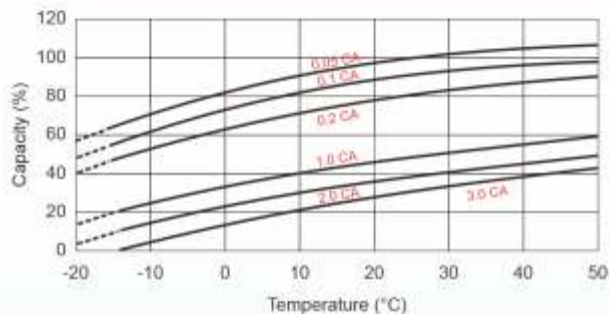
Discharge Characteristics



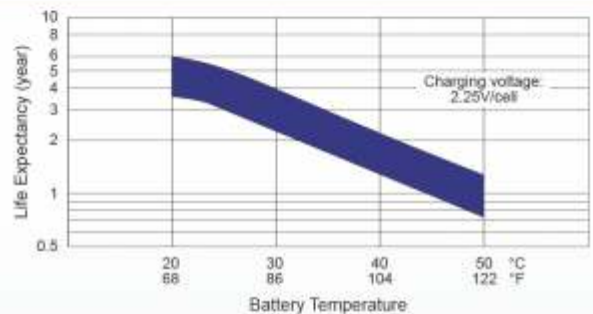
Float Charging Characteristics



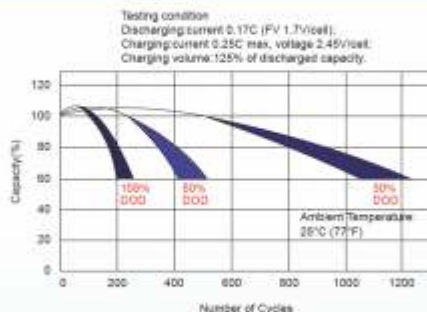
Temperature Effects in Relation to Battery Capacity



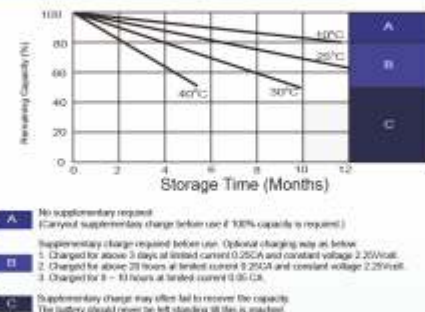
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 3.2-6

6V 3.2AH



FZA 3.2-6



Physical Specification

Part Number:	FZA 3.2-6
Length:	134 ± 2 mm (5.27 inches)
Width:	34 ± 2 mm (1.34 inches)
Container Height:	60 ± 2 mm (2.36inches)
Total Height (with terminal):	66 ± 2 mm (2.60 inches)
Approx Weight:	Approx 0.65kg (1.48lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	3.2 AH
	Standard Terminal	F1
Container Material	Optional Terminal	-
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	3.40 AH/0.16A	(20hr, 1.80V/cell, 25°C / 77°F)
	2.98 AH/0.298A	(10hr, 1.80V/cell, 25°C / 77°F)
	2.70 AH/0.54A	(5hr, 1.75V/cell, 25°C / 77°F)
	2.46 AH/0.82A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	2.01 AH/2.01A	(1hr, 1.60V/cell, 25°C / 77°F)
	48A (5s)	
Internal Resistance	Approx 28mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.3A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



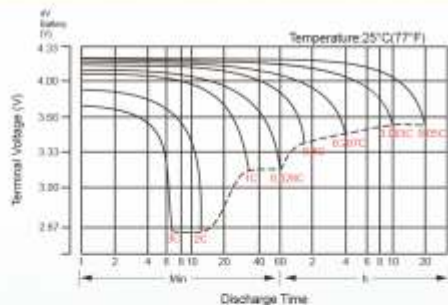
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	6.09	4.68	3.88	3.35	2.59	1.91	1.61	0.95	0.74	0.61	0.494	0.428	0.345	0.289	0.158
1.80V/cell	8.18	5.98	4.68	3.96	3.06	2.22	1.80	1.04	0.80	0.65	0.530	0.460	0.366	0.298	0.160
1.75V/cell	9.22	6.57	5.12	4.26	3.17	2.30	1.89	1.08	0.82	0.66	0.544	0.472	0.373	0.306	0.162
1.70V/cell	10.16	7.16	5.46	4.48	3.30	2.40	1.95	1.10	0.84	0.68	0.558	0.482	0.378	0.312	0.164
1.65V/cell	11.20	7.73	5.81	4.76	3.49	2.46	1.99	1.12	0.87	0.70	0.573	0.492	0.384	0.318	0.167
1.60V/cell	12.35	8.39	6.21	5.07	3.68	2.56	2.01	1.17	0.90	0.72	0.592	0.503	0.388	0.322	0.168

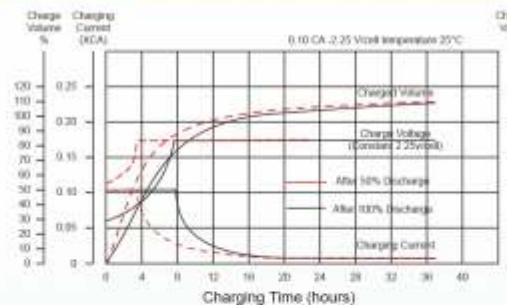
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	11.14	8.64	7.23	6.32	4.94	3.67	3.10	1.85	1.45	1.18	0.968	0.842	0.682	0.571	0.314
1.80V/cell	14.80	10.92	8.62	7.36	5.74	4.23	3.46	2.00	1.55	1.26	1.034	0.900	0.721	0.588	0.316
1.75V/cell	16.33	11.80	9.30	7.84	5.91	4.35	3.60	2.07	1.58	1.28	1.058	0.921	0.732	0.603	0.319
1.70V/cell	17.48	12.57	9.79	8.18	6.12	4.51	3.70	2.12	1.62	1.31	1.083	0.939	0.742	0.615	0.325
1.65V/cell	19.00	13.44	10.3	8.62	6.40	4.58	3.76	2.14	1.68	1.35	1.109	0.957	0.751	0.626	0.329
1.60V/cell	20.48	14.26	10.9	9.08	6.71	4.75	3.78	2.22	1.72	1.39	1.141	0.974	0.757	0.632	0.330

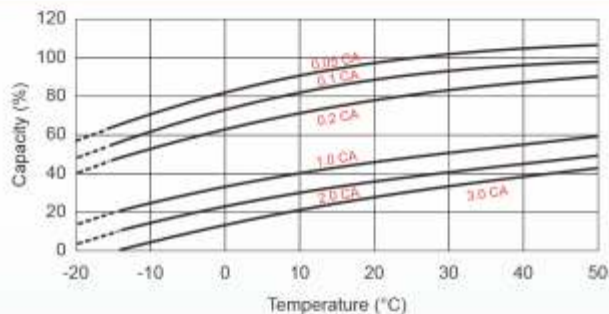
Discharge Characteristics



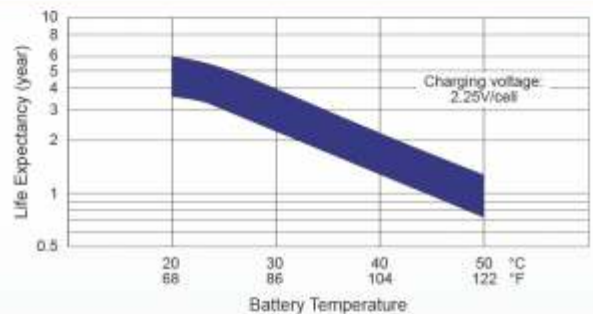
Float Charging Characteristics



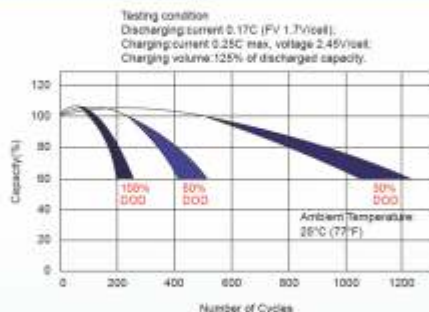
Temperature Effects in Relation to Battery Capacity



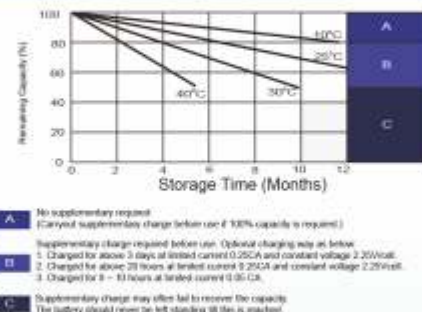
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 4-6



Physical Specification

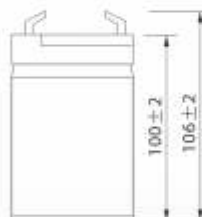
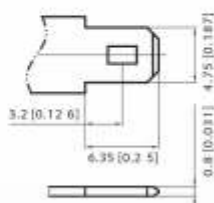
Part Number:	FZA 4-6
Length:	70 ± 2 mm (2.76 inches)
Width:	47 ± 2 mm (1.85 inches)
Container Height:	100 ± 2 mm (3.94 inches)
Total Height (with terminal):	106 ± 2 mm (4.17 inches)
Approx Weight:	Approx 0.70kg (1.565lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	4.0AH
	Standard Terminal	F1
Container Material	Optional Terminal	-
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	4.0 AH/0.20A	(20hr, 1.80V/cell, 25°C / 77°F)
	3.72 AH/0.372A	(10hr, 1.80V/cell, 25°C / 77°F)
	3.40 AH/0.68A	(5hr, 1.75V/cell, 25°C / 77°F)
	3.06 AH/1.02A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	2.51 AH/2.51A	(1hr, 1.60V/cell, 25°C / 77°F)
	60A (5s)	
Internal Resistance	Approx 45mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 1.2A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



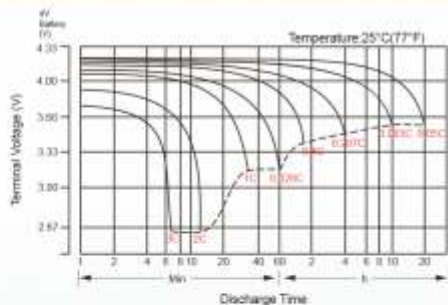
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	7.62	5.85	4.85	4.19	3.24	2.39	2.01	1.19	0.93	0.76	0.62	0.54	0.432	0.361	0.198
1.80V/cell	10.2	7.47	5.85	4.95	3.82	2.78	2.25	1.30	1.00	0.81	0.66	0.57	0.458	0.372	0.200
1.75V/cell	11.5	8.21	6.39	5.33	3.97	2.88	2.36	1.35	1.02	0.83	0.68	0.59	0.466	0.382	0.202
1.70V/cell	12.7	8.95	6.83	5.6	4.13	3.00	2.43	1.38	1.05	0.85	0.70	0.60	0.473	0.39	0.206
1.65V/cell	14.0	9.66	7.26	5.95	4.36	3.07	2.49	1.40	1.09	0.88	0.72	0.62	0.480	0.398	0.208
1.60V/cell	15.4	10.5	7.76	6.34	4.60	3.20	2.51	1.46	1.13	0.90	0.74	0.63	0.485	0.402	0.210

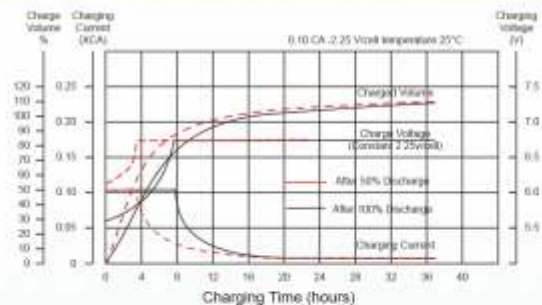
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	13.9	10.8	9.04	7.90	6.17	4.59	3.88	2.31	1.81	1.48	1.21	1.05	0.853	0.714	0.392
1.80V/cell	18.5	13.6	10.8	9.20	7.17	5.29	4.32	2.50	1.94	1.57	1.29	1.12	0.902	0.735	0.396
1.75V/cell	20.4	14.8	11.6	9.80	7.39	5.44	4.50	2.59	1.97	1.60	1.32	1.15	0.915	0.754	0.399
1.70V/cell	21.9	15.7	12.2	10.2	7.65	5.64	4.63	2.65	2.02	1.64	1.35	1.17	0.927	0.768	0.406
1.65V/cell	23.8	16.8	12.9	10.8	8.00	5.73	4.70	2.67	2.10	1.69	1.39	1.20	0.939	0.783	0.411
1.60V/cell	25.6	17.8	13.6	13.6	8.39	5.94	4.72	2.77	2.15	1.74	1.43	1.22	0.947	0.790	0.413

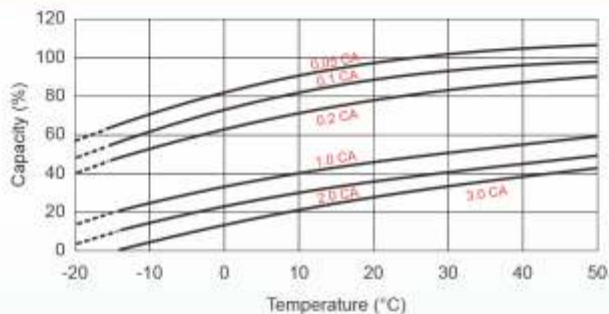
Discharge Characteristics



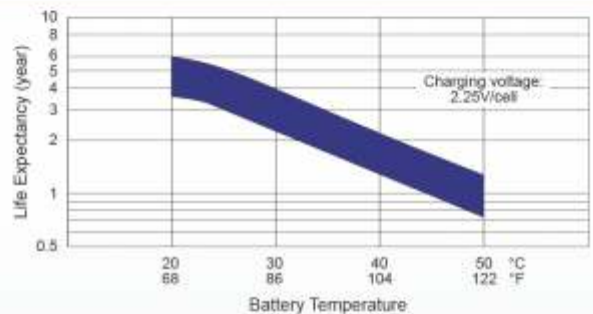
Float Charging Characteristics



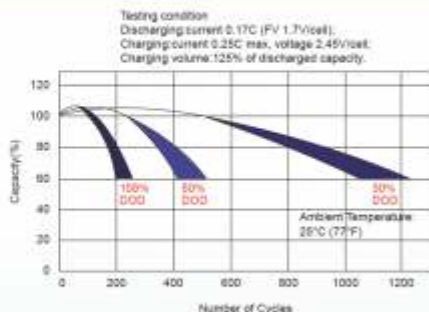
Temperature Effects in Relation to Battery Capacity



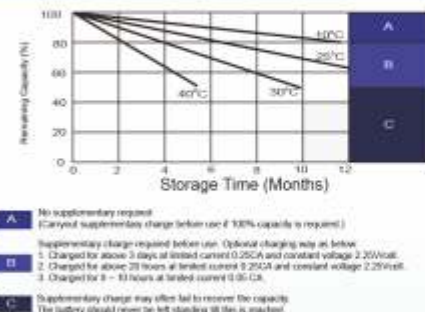
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 7-6



Physical Specification

Part Number:	FZA 7-6
Length:	151 ± 2 mm (5.94 inches)
Width:	34 ± 2 mm (1.34 inches)
Container Height:	94 ± 2 mm (3.70inches)
Total Height (with terminal):	100 ± 2 mm (3.94 inches)
Approx Weight:	Approx 1.10kg (2.425lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	7AH
	Standard Terminal	F1
Container Material	Optional Terminal	F2
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	7.00 AH/0.350A	(20hr, 1.80V/cell, 25°C / 77°F)
	6.51 AH/0.651A	(10hr, 1.80V/cell, 25°C / 77°F)
	5.95 AH/1.19A	(5hr, 1.75V/cell, 25°C / 77°F)
	5.37 AH/1.79A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	4.40 AH/4.40A	(1hr, 1.60V/cell, 25°C / 77°F)
	105A (5s)	
Internal Resistance	Approx 15mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 2.1A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



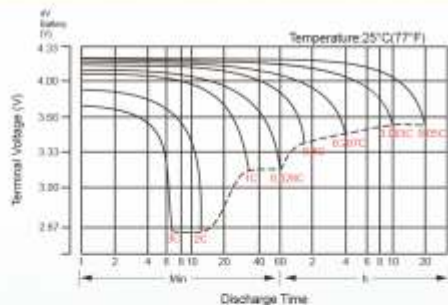
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	13.3	10.2	8.48	7.33	5.67	4.18	3.52	2.08	1.63	1.32	1.08	0.94	0.756	0.631	0.347
1.80V/cell	17.9	13.1	10.21	8.67	6.69	4.86	3.94	2.27	1.75	1.41	1.16	1.01	0.802	0.651	0.350
1.75V/cell	20.2	14.4	11.2	9.32	6.94	5.04	4.13	2.36	1.79	1.45	1.19	1.03	0.816	0.669	0.354
1.70V/cell	22.2	15.7	11.9	9.80	7.23	5.24	4.26	2.42	1.83	1.48	1.22	1.05	0.827	0.682	0.360
1.65V/cell	24.5	16.9	12.7	10.4	7.63	5.37	4.35	2.45	1.91	1.54	1.25	1.08	0.840	0.696	0.365
1.60V/cell	27.0	18.4	13.6	11.1	8.05	5.60	4.40	2.56	1.97	1.58	1.30	1.10	0.848	0.704	0.367

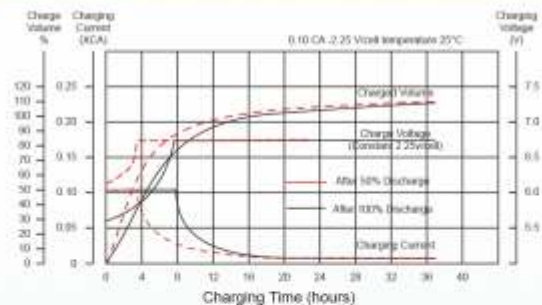
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	24.4	18.9	15.8	13.8	10.8	8.03	6.79	4.04	3.18	2.59	2.12	1.84	1.492	1.250	0.686
1.80V/cell	32.4	23.9	18.9	16.1	12.6	9.26	7.57	4.38	3.40	2.75	2.26	1.97	1.578	1.286	0.692
1.75V/cell	35.7	25.8	20.3	17.2	12.9	9.52	7.88	4.53	3.45	2.80	2.31	2.02	1.602	1.319	0.698
1.70V/cell	38.2	27.5	21.4	17.9	13.4	9.86	8.10	4.63	3.54	2.87	2.37	2.05	1.622	1.345	0.710
1.65V/cell	41.6	29.4	22.6	18.9	14.0	10.0	8.23	4.67	3.67	2.96	2.43	2.09	1.644	1.370	0.719
1.60V/cell	44.8	31.2	23.8	19.9	14.7	10.4	8.26	4.85	3.76	3.04	2.50	2.13	1.656	1.383	0.722

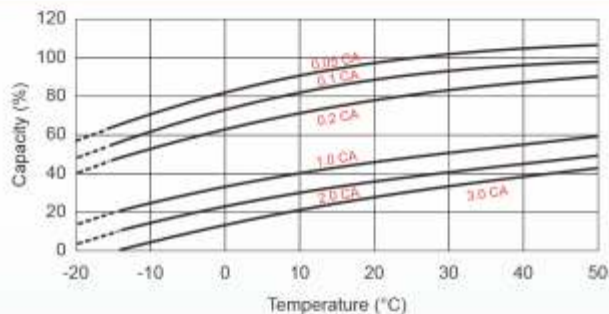
Discharge Characteristics



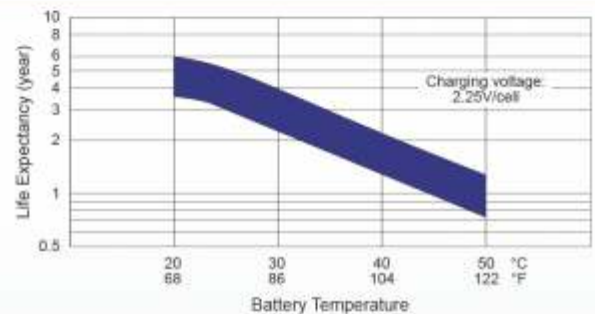
Float Charging Characteristics



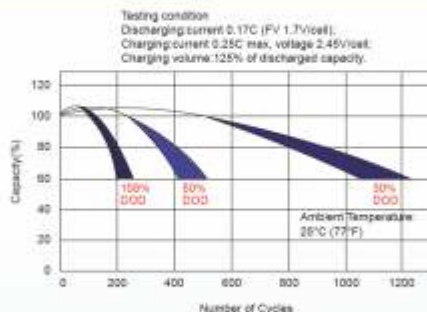
Temperature Effects in Relation to Battery Capacity



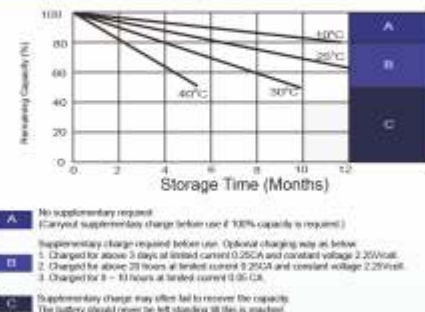
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 12-6

6V 12AH



FZA 12-6



Physical Specification

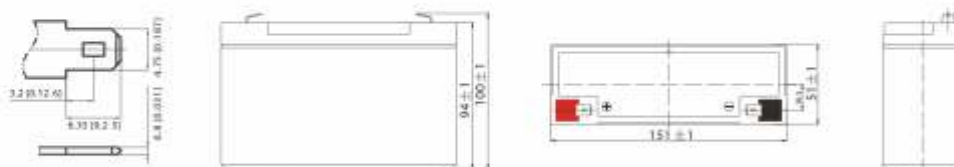
Part Number:	FZA 12-6
Length:	151 ± 2 mm (5.94 inches)
Width:	51 ± 2 mm (2.01 inches)
Container Height:	94 ± 2 mm (3.70 inches)
Total Height (with terminal):	100 ± 2 mm (3.94 inches)
Approx Weight:	Approx 1.72kg (2.57lbs)

Specifications

Terminal Type	Normal Voltage	6V
	Normal Capacity (20HR)	12AH
	Standard Terminal	F1
Container Material	Optional Terminal	F2
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	12.0 AH/0.60A	(20hr, 1.80V/cell, 25°C / 77°F)
	11.16 AH/1.12A	(10hr, 1.80V/cell, 25°C / 77°F)
	10.2 AH/2.04A	(5hr, 1.75V/cell, 25°C / 77°F)
	9.2 AH/3.06A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	7.54 AH/7.54A	(1hr, 1.60V/cell, 25°C / 77°F)
	180A (5s)	
Internal Resistance	Approx 15mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 3.6A. Voltage 7.2V ~ 7.5V at 25°C (77°F) Temp. Coefficient -15mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 6.75V ~ 6.9V at 25°C (77°F) Temp. Coefficient -10mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



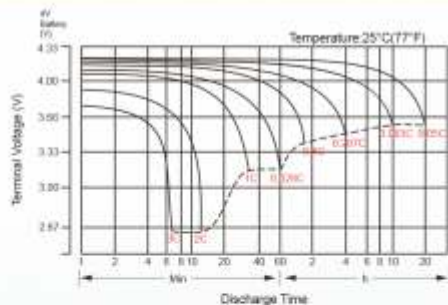
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	22.9	17.5	14.5	12.6	9.72	7.16	6.03	3.57	2.79	2.27	1.85	1.61	1.30	1.08	0.594
1.80V/cell	30.7	22.4	17.6	14.9	11.5	8.33	6.76	3.90	3.00	2.42	1.99	1.72	1.37	1.12	0.600
1.75V/cell	34.6	24.6	19.2	16.0	11.9	8.64	7.07	4.04	3.06	2.48	2.04	1.77	1.40	1.15	0.606
1.70V/cell	38.1	26.9	20.5	16.8	12.4	8.99	7.29	4.14	3.15	2.54	2.09	1.81	1.42	1.17	0.617
1.65V/cell	42.0	29.0	21.8	17.8	13.1	9.21	7.46	4.20	3.28	2.63	2.15	1.85	1.44	1.19	0.625
1.60V/cell	46.3	31.5	23.3	19.0	13.8	9.60	7.54	4.38	3.38	2.71	2.22	1.89	1.45	1.21	0.629

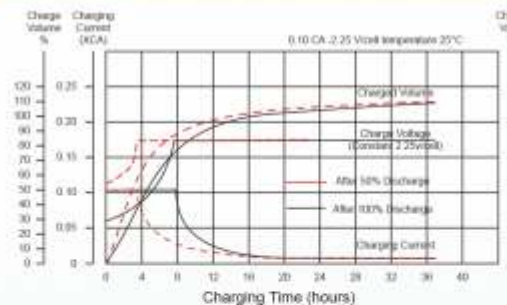
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	41.8	32.4	27.1	23.7	18.5	13.8	11.6	6.93	5.44	4.44	3.63	3.16	2.56	2.14	1.18
1.80V/cell	55.5	40.9	32.3	27.6	21.5	15.9	13.0	7.51	5.82	4.71	3.88	3.37	2.71	2.21	1.19
1.75V/cell	61.2	44.3	34.9	29.4	22.2	16.3	13.5	7.76	5.91	4.80	3.97	3.46	2.75	2.26	1.20
1.70V/cell	65.6	47.1	36.7	30.7	22.9	16.9	13.9	7.94	6.06	4.92	4.06	3.52	2.78	2.31	1.22
1.65V/cell	71.3	50.4	38.7	32.3	24.0	17.2	14.1	8.01	6.29	5.07	4.16	3.59	2.82	2.35	1.23
1.60V/cell	76.8	53.5	40.8	34.1	25.2	17.8	14.2	8.31	6.45	5.21	4.28	3.65	2.84	2.37	1.24

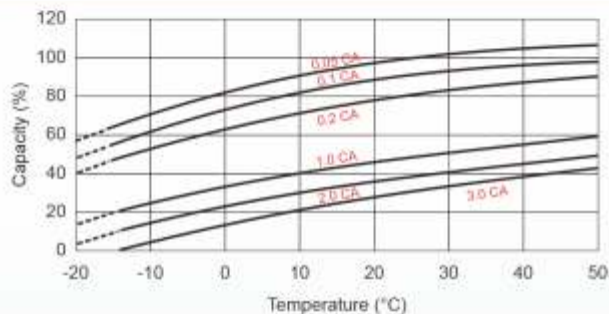
Discharge Characteristics



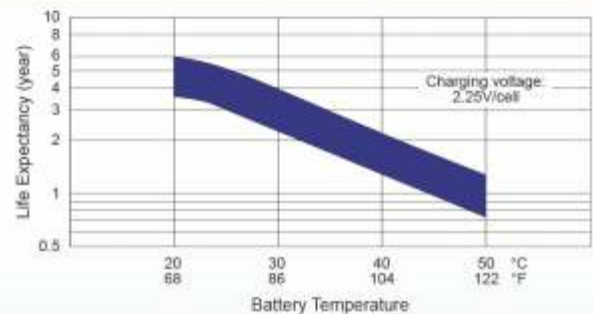
Float Charging Characteristics



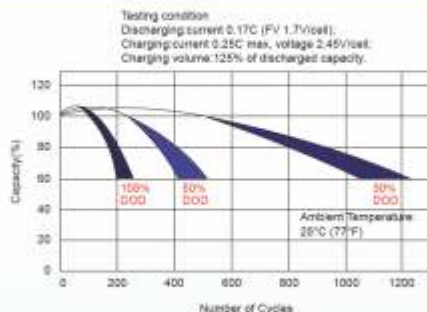
Temperature Effects in Relation to Battery Capacity



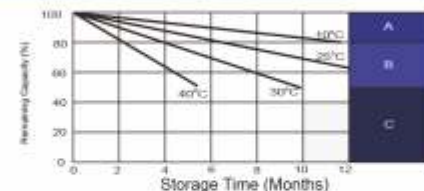
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required
(Carryout supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging may be below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell.
3. Charged for 8 - 10 hours at limited current 0.50 CA.
- C** Supplementary charge may often fail to recover the capacity.
(The battery should never be left standing 98 hrs is reached.)

FZA 1.3-12

12V 1.3AH



FZA 1.3-12



Physical Specification

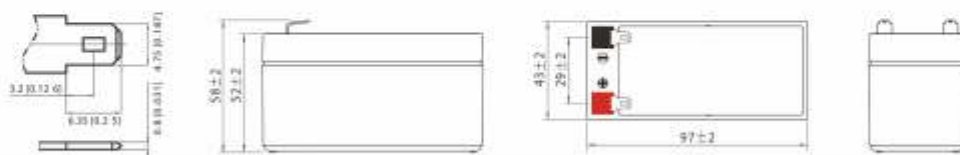
Part Number:	FZA 1.3-12
Length:	97 ± 2 mm (3.82 inches)
Width:	43 ± 2 mm (1.69 inches)
Container Height:	52 ± 2 mm (2.04 inches)
Total Height (with terminal):	58 ± 2 mm (2.28 inches)
Approx Weight:	Approx 0.57kg (1.26lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	1.3AH
	Standard Terminal	F1
Container Material	Optional Terminal	-
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	1.30 AH/0.600A	(20hr, 1.80V/cell, 25°C / 77°F)
	1.20 AH/0.112A	(10hr, 1.80V/cell, 25°C / 77°F)
	1.02 AH/0.204A	(5hr, 1.75V/cell, 25°C / 77°F)
	9.18 AH/0.306A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	0.754 AH/0.754A	(1hr, 1.60V/cell, 25°C / 77°F)
	18A (5s)	
Internal Resistance	Approx 90mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.36A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



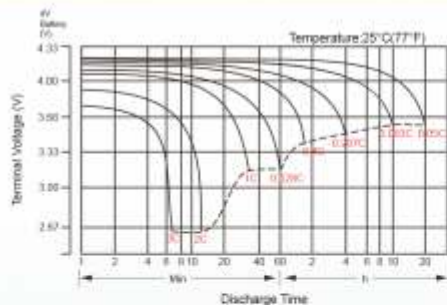
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	2.29	1.75	1.45	1.26	0.97	0.716	0.603	0.357	0.279	0.227	0.185	0.161	0.130	0.108	0.0594
1.80V/cell	3.07	2.24	1.76	1.49	1.15	0.833	0.676	0.390	0.300	0.242	0.199	0.172	0.137	0.112	0.0600
1.75V/cell	3.46	2.46	1.92	1.60	1.19	0.864	0.707	0.404	0.306	0.248	0.204	0.177	0.140	0.115	0.0606
1.70V/cell	3.81	2.69	2.05	1.68	1.24	0.899	0.729	0.414	0.315	0.254	0.209	0.181	0.142	0.117	0.0617
1.65V/cell	4.20	2.90	2.18	1.78	1.31	0.921	0.746	0.420	0.328	0.263	0.215	0.185	0.144	0.119	0.0625
1.60V/cell	4.63	3.15	2.33	1.90	1.38	0.960	0.754	0.438	0.338	0.271	0.222	0.189	0.145	0.121	0.0629

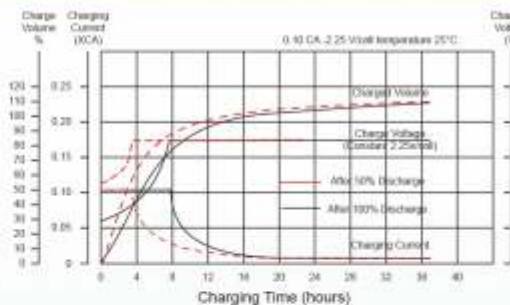
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	4.18	3.24	2.71	2.37	1.85	1.38	1.16	0.693	0.544	0.444	0.363	0.316	0.256	0.214	0.118
1.80V/cell	5.55	4.09	3.23	2.76	2.15	1.59	1.30	0.751	0.582	0.471	0.388	0.337	0.271	0.221	0.119
1.75V/cell	6.12	4.43	3.49	2.94	2.22	1.63	1.35	0.776	0.591	0.480	0.397	0.346	0.275	0.226	0.120
1.70V/cell	6.56	4.71	3.67	3.07	2.29	1.69	1.39	0.794	0.606	0.492	0.406	0.352	0.278	0.231	0.122
1.65V/cell	7.13	5.04	3.87	3.23	2.40	1.72	1.41	0.801	0.629	0.507	0.416	0.359	0.282	0.235	0.123
1.60V/cell	7.68	5.35	4.08	3.41	2.52	1.78	1.42	0.831	0.645	0.521	0.428	0.365	0.284	0.237	0.124

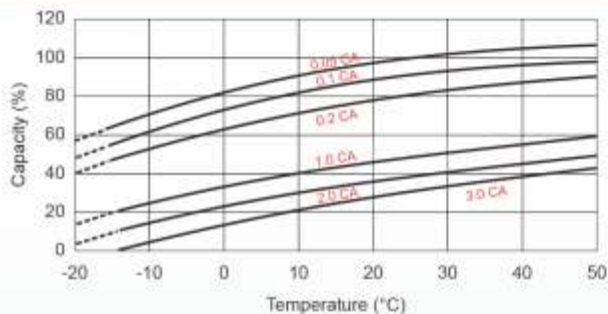
Discharge Characteristics



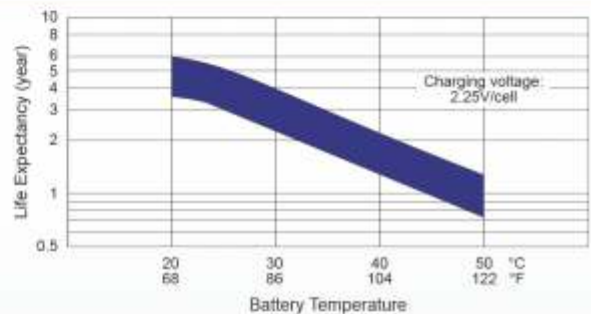
Float Charging Characteristics



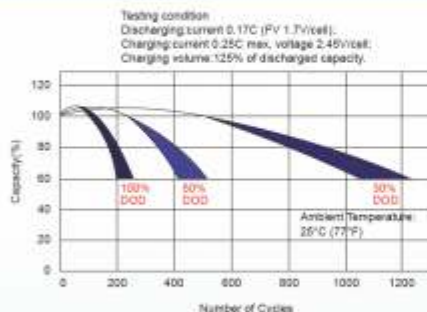
Temperature Effects in Relation to Battery Capacity



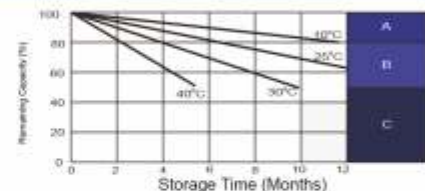
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required.
(Control supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell.
3. Charged for 6-18 hours at limited current 0.05 CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing 60-90 days without.

FZA 2.2-12

12V 2.2AH



FZA 2.2-12



Physical Specification

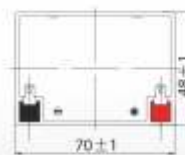
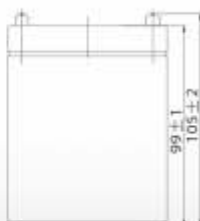
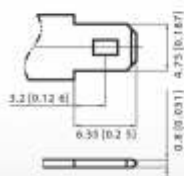
Part Number:	FZA 2.2-12
Length:	70 ± 2 mm (2.76 inches)
Width:	48 ± 2 mm (1.89 inches)
Container Height:	98 ± 2 mm (3.86 inches)
Total Height (with terminal):	104 ± 2 mm (4.09 inches)
Approx Weight:	Approx 0.80 kg (1.76lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (20HR)	2.2 AH
	Standard Terminal	F1
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	2.20 AH/0.110A	(20hr, 1.80V/cell, 25°C / 77°F)
	2.05 AH/0.205A	(10hr, 1.80V/cell, 25°C / 77°F)
	1.85 AH/0.37A	(5hr, 1.75V/cell, 25°C / 77°F)
	1.68 AH/0.56A	(3hr, 1.75V/cell, 25°C / 77°F)
	1.38 AH/1.38A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	33A (5s)	
Internal Resistance	Approx 100mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.66 A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



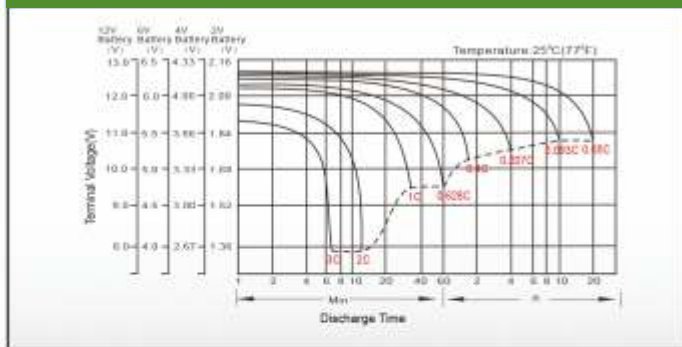
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	4.19	3.22	2.67	2.30	1.78	1.31	1.11	0.65	0.51	0.42	0.339	0.295	0.237	0.198	0.109
1.80V/cell	5.62	4.11	3.22	2.72	2.10	1.53	1.24	0.71	0.55	0.44	0.364	0.316	0.252	0.205	0.110
1.75V/cell	6.34	4.52	3.52	2.93	2.18	1.58	1.30	0.74	0.56	0.45	0.374	0.325	0.256	0.210	0.111
1.70V/cell	6.98	4.92	3.75	3.08	2.27	1.65	1.34	0.76	0.58	0.47	0.383	0.331	0.260	0.214	0.113
1.65V/cell	7.70	5.31	3.99	3.27	2.40	1.69	1.37	0.77	0.60	0.48	0.394	0.339	0.264	0.219	0.115
1.60V/cell	8.49	5.77	4.27	3.48	2.53	1.76	1.38	0.80	0.62	0.50	0.407	0.346	0.267	0.221	0.115

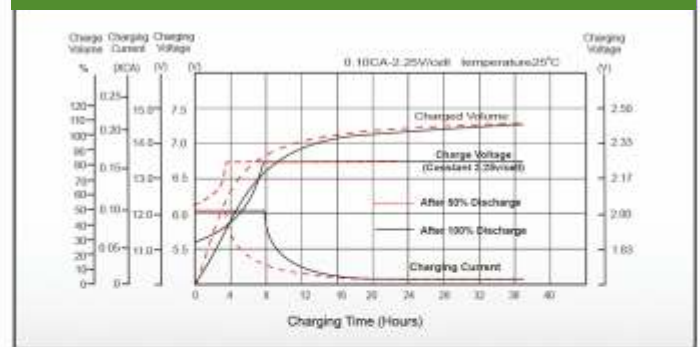
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	7.66	5.94	4.97	4.34	3.40	2.52	2.13	1.27	1.00	0.81	0.666	0.579	0.469	0.393	0.216
1.80V/cell	10.17	7.50	5.93	5.06	3.95	2.91	2.38	1.38	1.07	0.86	0.711	0.619	0.496	0.404	0.218
1.75V/cell	11.23	8.11	6.40	5.39	4.06	2.99	2.48	1.42	1.08	0.88	0.727	0.633	0.503	0.415	0.219
1.70V/cell	12.02	8.64	6.73	5.62	4.20	3.10	2.55	1.46	1.11	0.90	0.744	0.646	0.510	0.423	0.223
1.65V/cell	13.07	9.24	7.10	5.93	4.40	3.15	2.59	1.47	1.15	0.93	0.762	0.658	0.517	0.431	0.226
1.60V/cell	14.08	9.81	7.47	6.25	4.61	3.26	2.60	1.52	1.18	0.96	0.785	0.670	0.521	0.435	0.227

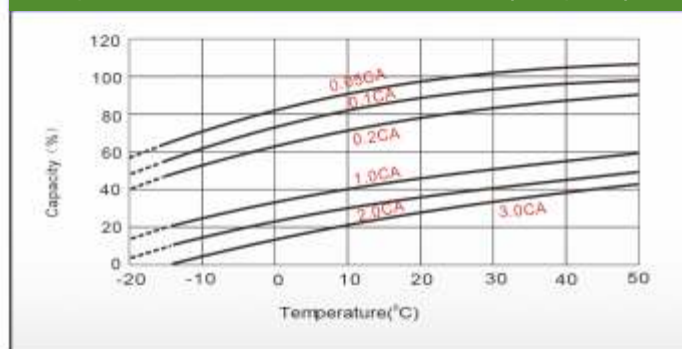
Discharge Characteristics



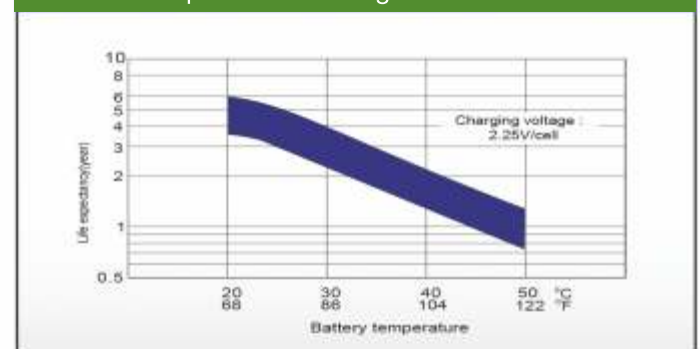
Float Charging Characteristics



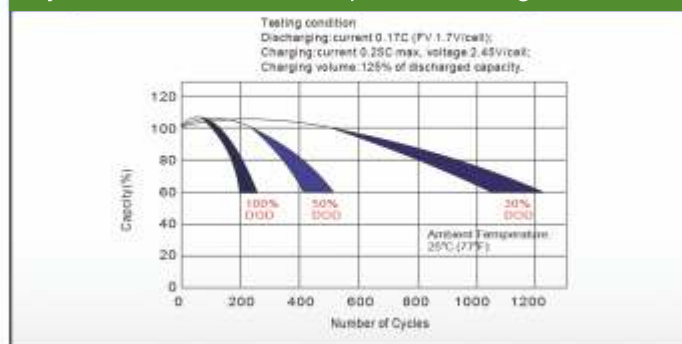
Temperature Effects in Relation to Battery Capacity



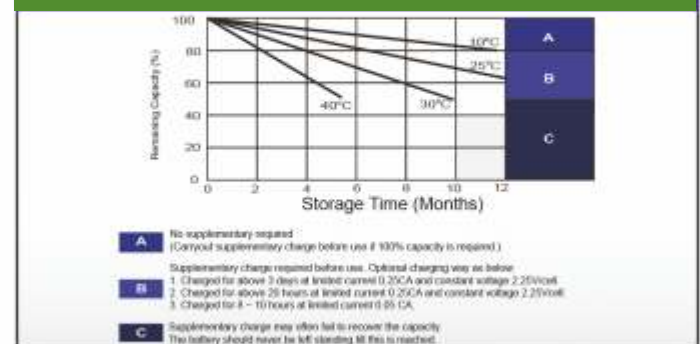
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 2.3-12

12V 2.3AH



FZA 2.3-12



Physical Specification

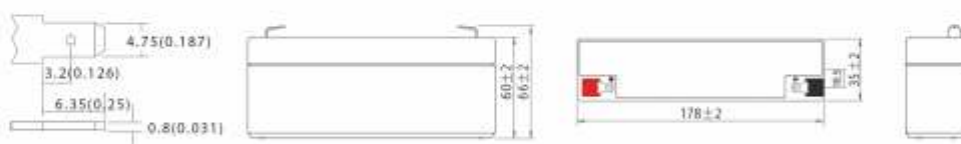
Part Number:	FZA 2.3-12
Length:	178 ± 2 mm (7.00 inches)
Width:	35 ± 2 mm (1.38 inches)
Container Height:	60 ± 2 mm (2.36 inches)
Total Height (with terminal):	66 ± 2 mm (2.60 inches)
Approx Weight:	Approx 0.89kg (1.96lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	2.3 AH
	Standard Terminal	F1
Container Material	Optional Terminal	-
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	2.40 AH/0.115A	(20hr, 1.80V/cell, 25°C / 77°F)
	2.23 AH/0.214A	(10hr, 1.80V/cell, 25°C / 77°F)
	1.95 AH/0.39A	(5hr, 1.75V/cell, 25°C / 77°F)
	1.79 AH/0.59A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	1.44 AH/1.44A	(1hr, 1.60V/cell, 25°C / 77°F)
	34.5A (5s)	
Internal Resistance	Approx 100mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 0.69A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



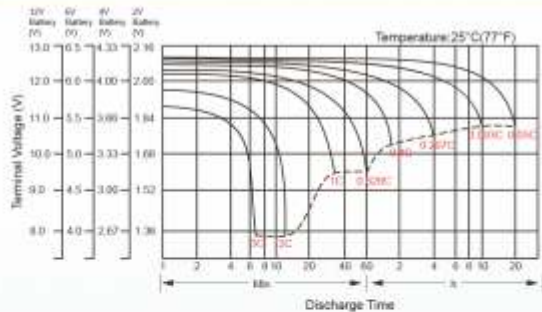
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	4.36	3.36	2.79	2.41	1.86	1.37	1.16	0.68	0.54	0.44	0.355	0.308	0.248	0.207	0.114
1.80V/cell	5.88	4.30	3.37	2.85	2.20	1.60	1.30	0.75	0.58	0.46	0.381	0.330	0.263	0.214	0.115
1.75V/cell	6.63	4.72	3.68	3.06	2.28	1.66	1.36	0.77	0.59	0.47	0.391	0.339	0.268	0.220	0.116
1.70V/cell	7.30	5.15	3.93	3.22	2.37	1.72	1.40	0.79	0.60	0.49	0.401	0.346	0.272	0.224	0.118
1.65V/cell	8.05	5.55	4.17	3.42	2.51	1.77	1.43	0.81	0.63	0.50	0.412	0.354	0.276	0.229	0.120
1.60V/cell	8.88	6.03	4.46	3.64	2.65	1.84	1.44	0.84	0.65	0.52	0.426	0.362	0.279	0.231	0.121

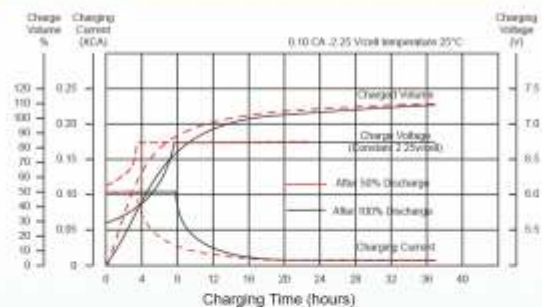
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	8.01	6.21	5.20	4.54	3.55	2.64	2.23	1.33	1.04	0.85	0.696	0.605	0.490	0.411	0.226
1.80V/cell	10.6	7.85	6.20	5.29	4.12	3.04	2.49	1.44	1.12	0.90	0.743	0.647	0.518	0.423	0.227
1.75V/cell	11.7	8.48	6.69	5.64	4.25	3.13	2.59	1.49	1.13	0.92	0.760	0.662	0.526	0.433	0.229
1.70V/cell	12.6	9.04	7.04	5.88	4.40	3.24	2.66	1.52	1.16	0.94	0.778	0.675	0.533	0.442	0.233
1.65V/cell	13.7	9.66	7.43	6.20	4.60	3.29	2.70	1.53	1.21	0.97	0.797	0.688	0.540	0.450	0.236
1.60V/cell	14.7	10.25	7.81	6.53	4.82	3.41	2.72	1.59	1.24	1.00	0.820	0.700	0.544	0.454	0.237

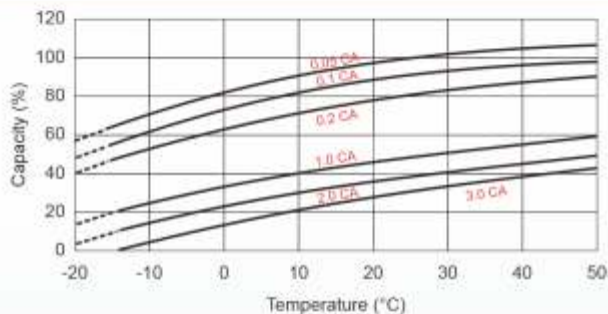
Discharge Characteristics



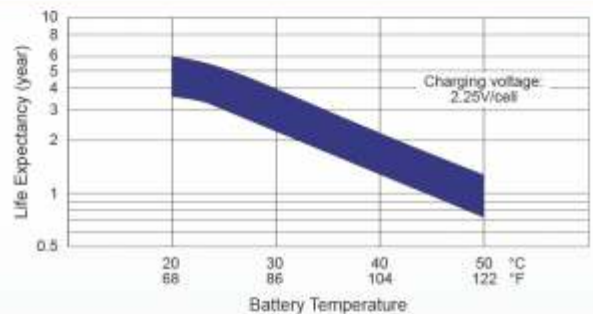
Float Charging Characteristics



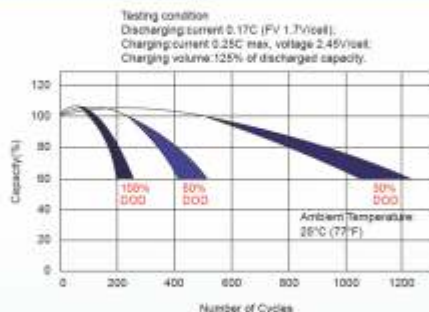
Temperature Effects in Relation to Battery Capacity



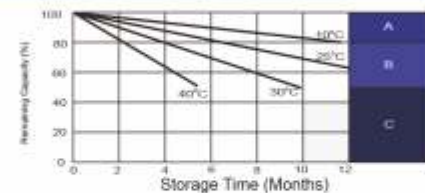
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required
(Carryout supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging may be below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell;
2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell;
3. Charged for 8 - 10 hours at limited current 0.50 CA.
- C** Supplementary charge may often fail to recover the capacity
(The battery should never be left standing 98 hrs is reached).

FZA 4.5-12

12V 4.5AH



FZA 4.5-12



Physical Specification

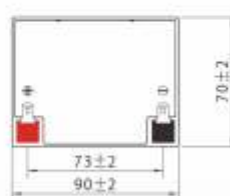
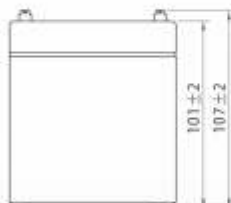
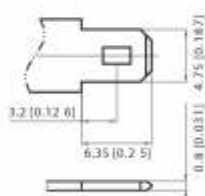
Part Number:	FZA 4.5-12
Length:	90 ± 2 mm (3.54 inches)
Width:	70 ± 2 mm (2.76 inches)
Container Height:	101 ± 2 mm (3.98 inches)
Total Height (with terminal):	107 ± 2 mm (4.21 inches)
Approx Weight:	Approx 1.45kg (2.98lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	4.5AH
	Standard Terminal	F1
Container Material	Optional Terminal	F2
	Standard Option	ABS
	Flame Retardant Option (FR)	UL94:VO
Rated Capacity	4.50 AH/0.225A	(20hr, 1.80V/cell, 25°C / 77°F)
	4.19 AH/0.419A	(10hr, 1.80V/cell, 25°C / 77°F)
	3.85 AH/0.77A	(5hr, 1.75V/cell, 25°C / 77°F)
	3.45 AH/1.15A	(3hr, 1.75V/cell, 25°C / 77°F)
	2.65 AH/2.65A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	40A (5s)	
Internal Resistance	Approx 40mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 1.35A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103% 25°C (77°F) 100% 0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



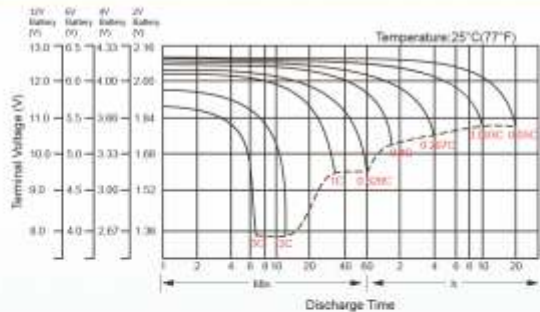
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	8.57	6.58	5.45	4.71	3.64	2.68	2.26	1.34	1.05	0.85	0.69	0.60	0.486	0.406	0.223
1.80V/cell	11.5	8.41	6.59	5.57	4.30	3.12	2.53	1.46	1.13	0.91	0.75	0.65	0.515	0.419	0.225
1.75V/cell	13.0	9.24	7.19	5.99	4.46	3.24	2.65	1.51	1.15	0.93	0.77	0.66	0.524	0.430	0.227
1.70V/cell	14.3	10.1	7.68	6.30	4.65	3.37	2.74	1.55	1.18	0.95	0.78	0.68	0.532	0.438	0.231
1.65V/cell	15.7	10.9	8.17	6.69	4.90	3.45	2.80	1.58	1.23	0.99	0.81	0.69	0.540	0.447	0.234
1.60V/cell	17.4	11.8	8.73	7.13	5.18	3.60	2.83	1.64	1.27	1.02	0.83	0.71	0.545	0.452	0.236

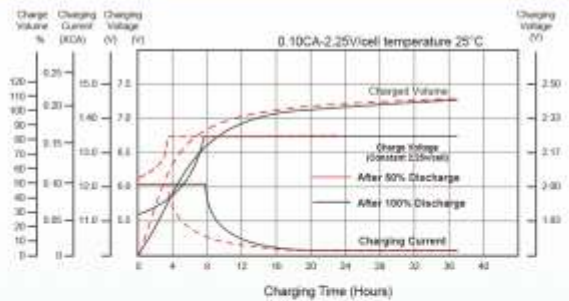
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	15.7	12.2	10.2	8.88	6.95	5.16	4.37	2.60	2.04	1.66	1.36	1.18	0.959	0.803	0.441
1.80V/cell	20.8	15.4	12.1	10.3	8.07	5.96	4.86	2.82	2.18	1.77	1.45	1.27	1.014	0.827	0.445
1.75V/cell	23.0	16.6	13.1	11.0	8.31	6.12	5.06	2.91	2.22	1.80	1.49	1.30	1.030	0.848	0.449
1.70V/cell	24.6	17.7	13.8	11.5	8.60	6.34	5.21	2.98	2.27	1.85	1.52	1.32	1.043	0.864	0.457
1.65V/cell	26.7	18.9	14.5	12.1	9.00	6.44	5.29	3.00	2.36	1.90	1.56	1.35	1.057	0.881	0.462
1.60V/cell	28.8	20.1	15.3	12.8	9.43	6.68	5.31	3.12	2.42	1.96	1.61	1.37	1.065	0.889	0.464

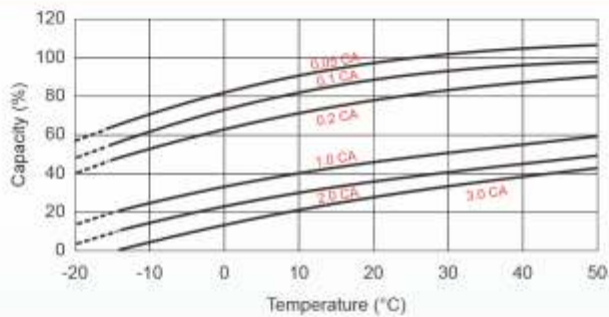
Discharge Characteristics



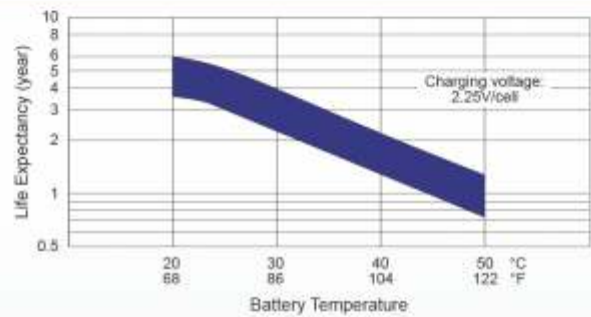
Float Charging Characteristics



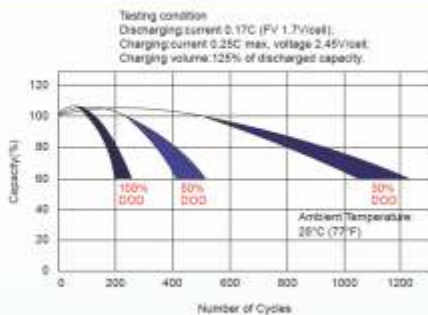
Temperature Effects in Relation to Battery Capacity



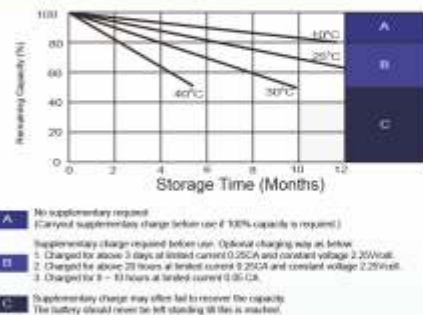
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 7-12

12V 7AH



FZA 7-12



Physical Specification

Part Number:	FZA 7-12
Length:	151 ± 2 mm (3.54 inches)
Width:	65 ± 2 mm (2.76 inches)
Container Height:	93.5 ± 2 mm (3.98 inches)
Total Height (with terminal):	99 ± 2 mm (4.21 inches)
Approx Weight:	Approx 1.95 kg

Specifications

Terminal Type	Nominal Voltage	12V	
	Nominal Capacity (20HR)	7AH	
	Standard Terminal	F1	
Container Material	Optional Terminal	F2	
	Standard Option	ABS	
Rated Capacity	Flame Retardant Option (FR)	ABS (UL94:VO)	
	7.00 AH/0.350A	(20hr,1.80V/cell, 25°C / 77°F)	
	6.51 AH/0.653A	(10hr,1.80V/cell, 25°C / 77°F)	
	6.00 AH/1.20A	(5hr,1.75V/cell, 25°C / 77°F)	
	5.37 AH/1.79A	(3hr,1.75V/cell, 25°C / 77°F)	
	4.55 AH/4.55A	(1hr,1.60V/cell, 25°C / 77°F)	
Max Discharge Current	105A (5s)		
Internal Resistance	Approx 23mΩ		
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)	
		Charge: 0 ~ 40°C (5 ~ 104°F)	
		Storage: -15 ~ 40°C (5 ~ 104°F)	
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)	
	Cycle Use	Initial Charging Current less than 2.1A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C	
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C	
	Capacity affected by Temperature	40°C (104°F)	103%
		25°C (77°F)	100%
		0°C (32°F)	86%
Design Floating Life at 20°C	5 Years		

Dimensions

F1 Terminal



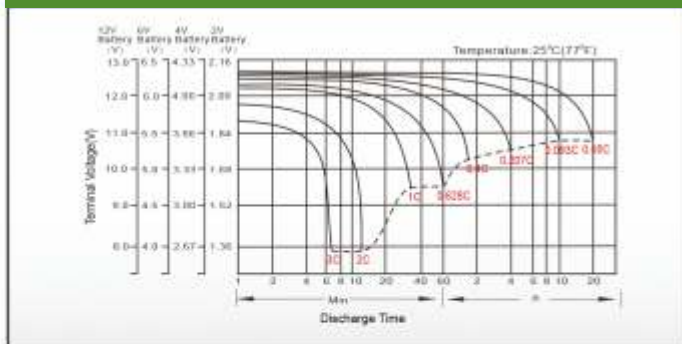
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	18.0	12.8	10.48	8.79	6.53	4.79	3.86	2.29	1.69	1.36	1.14	0.98	0.774	0.640	0.345
1.80V/cell	21.4	14.3	11.4	9.44	6.94	5.05	4.03	2.38	1.74	1.40	1.17	1.01	0.791	0.653	0.350
1.75V/cell	24.2	15.6	12.2	10.0	7.29	5.27	4.18	2.45	1.79	1.43	1.20	1.03	0.805	0.663	0.357
1.70V/cell	26.7	16.7	12.9	10.5	7.59	5.46	4.32	2.51	1.83	1.46	1.22	1.05	0.817	0.672	0.361
1.65V/cell	28.8	17.7	13.5	10.9	7.86	5.62	4.46	2.57	1.86	1.48	1.23	1.06	0.826	0.680	0.365
1.60V/cell	30.6	18.6	14.1	11.3	8.09	5.76	4.55	2.61	1.89	1.50	1.25	1.07	0.834	0.685	0.367

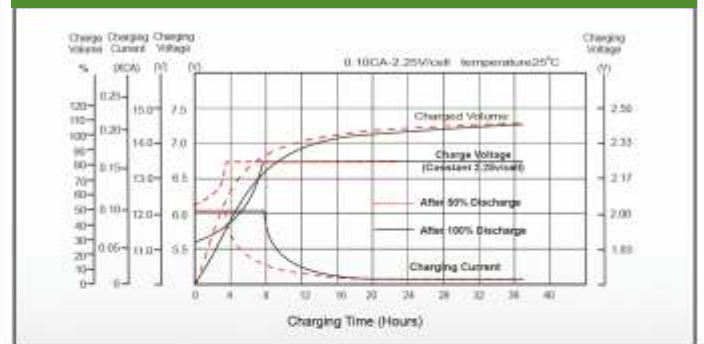
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	34.2	24.5	20.2	17.1	12.8	9.44	7.64	4.56	3.37	2.72	2.29	1.99	1.565	1.296	0.701
1.80V/cell	40.2	27.2	21.9	18.3	13.5	9.91	7.96	4.72	3.47	2.79	2.34	2.03	1.593	1.318	0.708
1.75V/cell	45.1	29.5	23.3	19.3	14.2	10.3	8.23	4.85	3.55	2.85	2.39	2.06	1.616	1.334	0.719
1.70V/cell	49.2	31.3	24.5	20.1	14.7	10.6	8.48	4.96	3.62	2.89	2.42	2.09	1.633	1.347	0.725
1.65V/cell	52.6	32.9	25.5	20.8	15.2	10.9	8.73	5.05	3.68	2.93	2.45	2.11	1.649	1.359	0.731
1.60V/cell	55.5	34.3	26.3	21.5	15.5	11.2	8.88	5.12	3.72	2.96	2.47	2.13	1.660	1.367	0.734

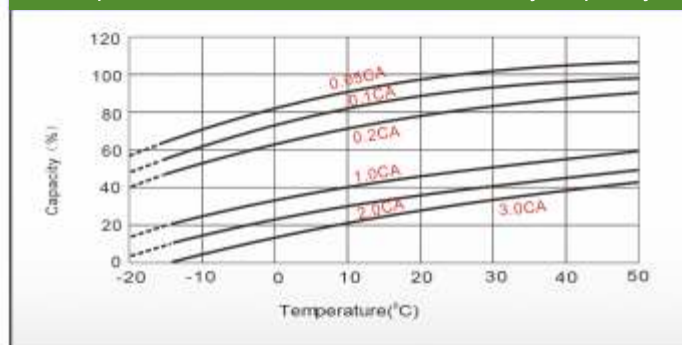
Discharge Characteristics



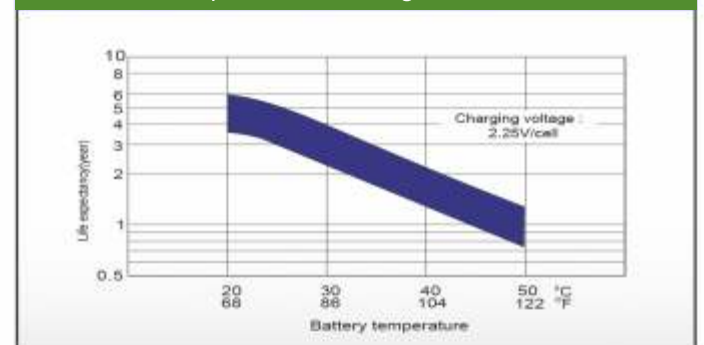
Float Charging Characteristics



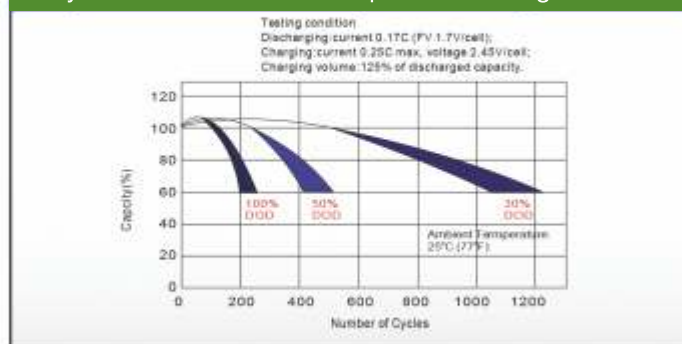
Temperature Effects in Relation to Battery Capacity



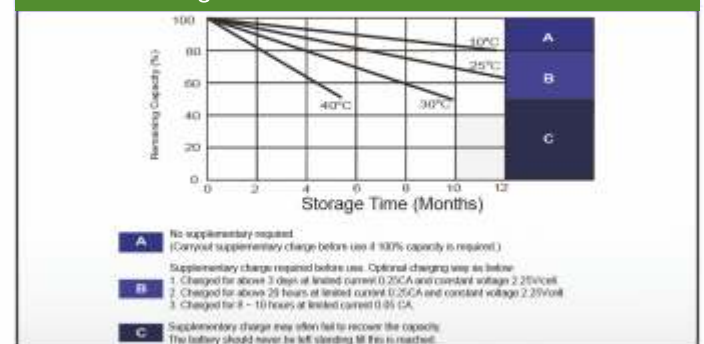
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 7.2-12

12V 7.2 AH



FZA 7.2-12



Physical Specification

Part Number:	FZA 7.2 -12
Length:	151 ± 2 mm (5.95 inches)
Width:	65 ± 2 mm (2.56 inches)
Container Height:	93.5 ± 2 mm (3.68 inches)
Total Height (with terminal):	99 ± 2 mm (3.90 inches)
Approx Weight:	Approx 2.15 kg (4.74lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (20HR)	7.2AH
	Standard Terminal	F1
	Optional Terminal	F2
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	7.20 AH/0.36A	(20hr,1.80V/cell, 25°C / 77°F)
	6.70 AH/0.67A	(10hr,1.80V/cell, 25°C / 77°F)
	6.12 AH/1.22A	(5hr,1.75V/cell, 25°C / 77°F)
	5.51 AH/1.84A	(3hr,1.75V/cell, 25°C / 77°F)
	4.52 AH/4.52A	(1hr,1.60V/cell, 25°C / 77°F)
Max Discharge Current	108A (5s)	
Internal Resistance	Approx 18mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 2.16A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



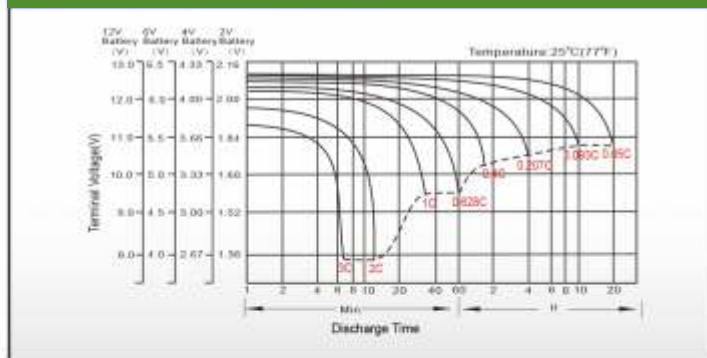
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	13.7	10.5	8.72	7.54	5.83	4.30	3.62	2.14	1.68	1.36	1.11	0.96	0.777	0.649	0.356
1.80V/cell	18.4	13.5	10.5	8.91	6.88	5.00	4.06	2.34	1.80	1.45	1.19	1.03	0.825	0.670	0.360
1.75V/cell	20.8	14.8	11.5	9.59	7.14	5.18	4.24	2.42	1.84	1.49	1.22	1.06	0.839	0.688	0.364
1.70V/cell	22.9	16.1	12.3	10.1	7.43	5.39	4.38	2.48	1.89	1.53	1.25	1.08	0.851	0.701	0.370
1.65V/cell	25.2	17.4	13.1	10.7	7.84	5.53	4.48	2.52	1.97	1.58	1.29	1.11	0.864	0.716	0.375
1.60V/cell	27.8	18.9	14.0	11.4	8.28	5.76	4.52	2.63	2.03	1.63	1.33	1.13	0.872	0.724	0.377

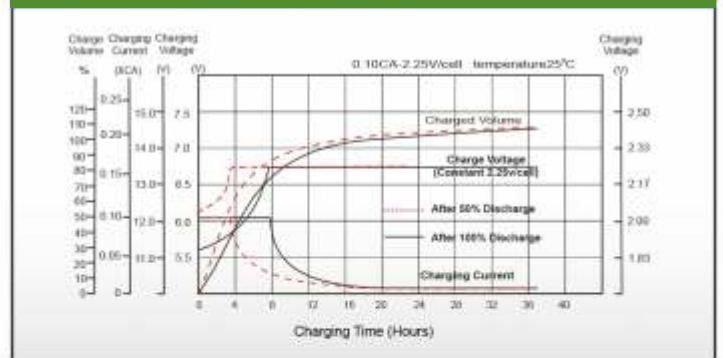
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	25.1	19.4	16.3	14.2	11.1	8.26	6.98	4.16	3.27	2.66	2.18	1.90	1.53	1.29	0.706
1.80V/cell	33.3	24.6	19.4	16.6	12.9	9.53	7.78	4.51	3.49	2.83	2.33	2.02	1.62	1.32	0.712
1.75V/cell	36.7	26.6	20.9	17.6	13.3	9.79	8.10	4.66	3.54	2.88	2.38	2.07	1.65	1.36	0.718
1.70V/cell	39.3	28.3	22.0	18.4	13.8	10.1	8.33	4.76	3.64	2.95	2.44	2.11	1.67	1.38	0.731
1.65V/cell	42.8	30.2	23.2	19.4	14.4	10.3	8.46	4.80	3.78	3.04	2.49	2.15	1.69	1.41	0.740
1.60V/cell	46.1	32.1	24.5	20.4	15.1	10.7	8.50	4.99	3.87	3.13	2.57	2.19	1.70	1.42	0.743

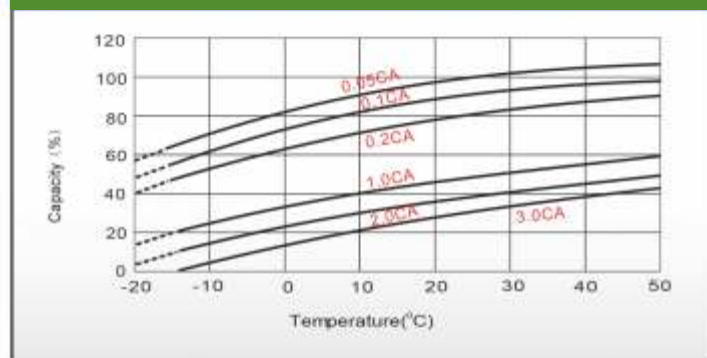
Discharge Characteristics



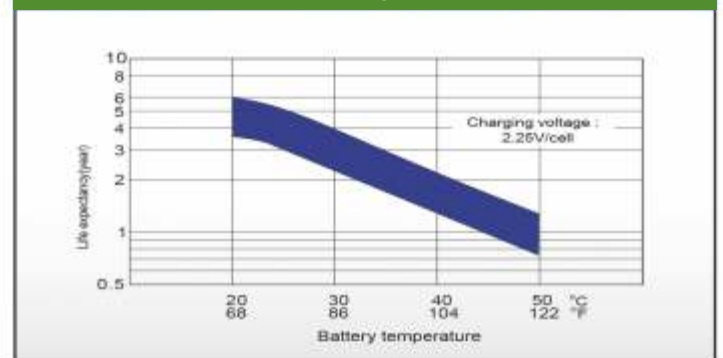
Float Charging Characteristics



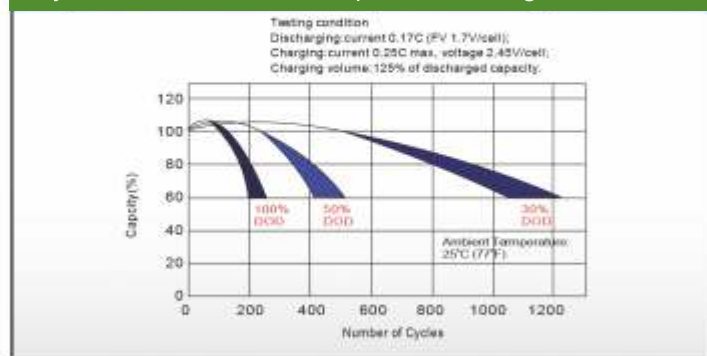
Temperature Effects in Relation to Battery Capacity



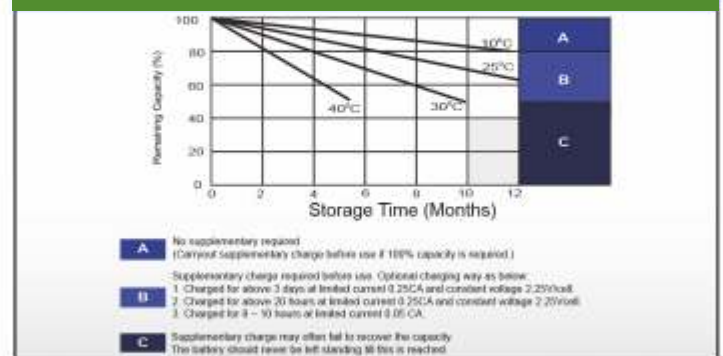
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 9-12

12V 9AH



FZA 9-12



Physical Specification

Part Number:	FZA 9-12
Length:	151 ± 2 mm (5.94 inches)
Width:	65 ± 2 mm (2.56 inches)
Container Height:	93.5 ± 2 mm (3.68 inches)
Total Height (with terminal):	99 ± 2 mm (3.90 inches)
Approx Weight:	Approx 2.45 kg (5.40lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	9AH
	Standard Terminal	F2
	Optional Terminal	F1
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS(UL94:VO)
Rated Capacity	9.00 AH/0.425A	(20hr, 1.80V/cell, 25°C / 77°F)
	8.37 AH/0.791A	(10hr, 1.80V/cell, 25°C / 77°F)
	7.22 AH/1.45A	(5hr, 1.75V/cell, 25°C / 77°F)
	6.50 AH/2.17A	(3hr, 1.75V/cell, 25°C / 77°F)
	5.34 AH/5.34A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	127.5A (5s)	
Internal Resistance	Approx 18mΩ	
Discharge Characteristics	Operating Temp. Range:	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 2.55A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



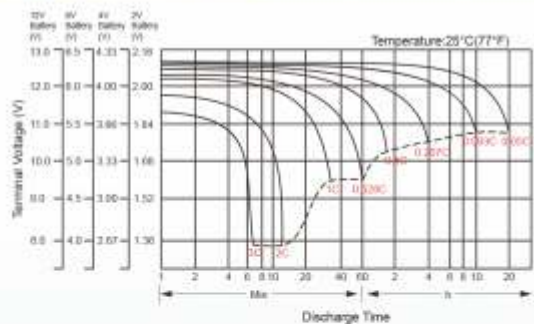
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	16.2	12.4	10.3	8.90	6.88	5.07	4.27	2.53	1.98	1.61	1.31	1.14	0.918	0.767	0.421
1.80V/cell	21.7	15.9	12.4	10.5	8.12	5.90	4.79	2.76	2.13	1.72	1.41	1.22	0.973	0.791	0.425
1.75V/cell	24.5	17.5	13.6	11.3	8.43	6.12	5.01	2.86	2.17	1.76	1.45	1.25	0.990	0.812	0.429
1.70V/cell	27.0	19.0	14.5	11.9	8.78	6.36	5.17	2.93	2.23	1.80	1.48	1.28	1.004	0.828	0.437
1.65V/cell	29.7	20.5	15.4	12.6	9.26	6.52	5.29	2.98	2.32	1.86	1.52	1.31	1.020	0.845	0.443
1.60V/cell	32.8	22.3	16.5	13.5	9.78	6.80	5.34	3.10	2.39	1.92	1.57	1.34	1.030	0.854	0.445

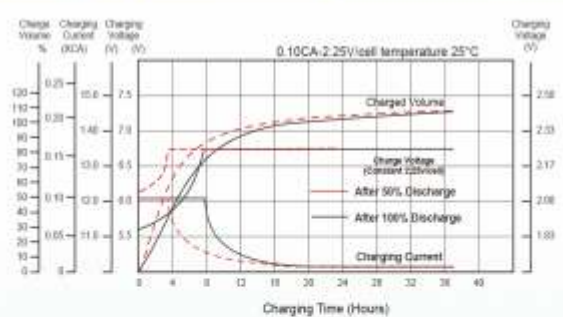
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	29.6	23.0	19.2	16.8	13.1	9.75	8.25	4.91	3.86	3.14	2.57	2.24	1.81	1.52	0.834
1.80V/cell	39.3	29.0	22.9	19.5	15.2	11.2	9.19	5.32	4.13	3.34	2.75	2.39	1.92	1.56	0.841
1.75V/cell	43.4	31.3	24.7	20.8	15.7	11.6	9.57	5.50	4.18	3.40	2.81	2.45	1.94	1.60	0.848
1.70V/cell	46.4	33.4	26.0	21.7	16.2	12.0	9.84	5.62	4.29	3.49	2.88	2.49	1.97	1.63	0.863
1.65V/cell	50.5	35.7	27.4	22.9	17.0	12.2	9.99	5.67	4.46	3.59	2.95	2.54	2.00	1.66	0.873
1.60V/cell	54.4	37.9	28.9	24.1	17.8	12.6	10.0	5.89	4.57	3.69	3.03	2.59	2.01	1.68	0.877

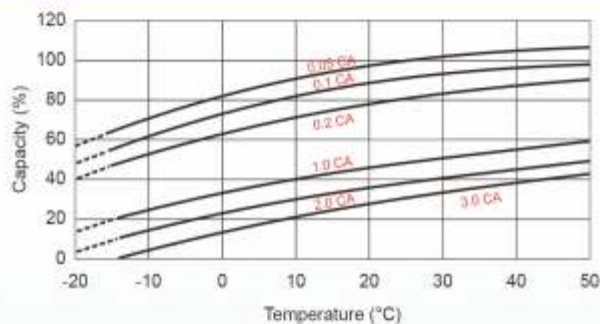
Discharge Characteristics



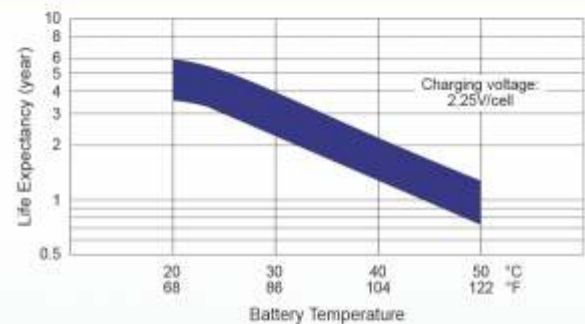
Float Charging Characteristics



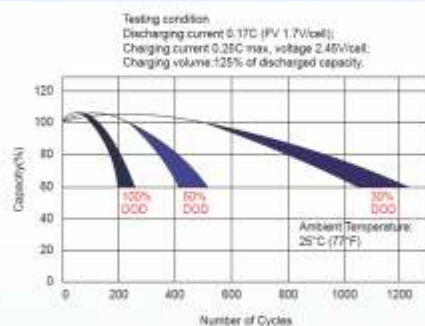
Temperature Effects in Relation to Battery Capacity



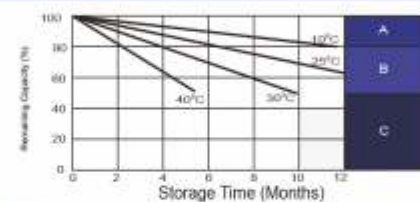
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary charge required.
(Charge supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optimal charging may be as follows:
1. Charged for about 3 days at limited current 0.25C and constant voltage 2.25V/cell.
2. Charged for 10-15 hours at limited current 0.25C and constant voltage 2.25V/cell.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing till this is reached.

FZA 12-12

12V 12AH



FZA 12-12



Physical Specification

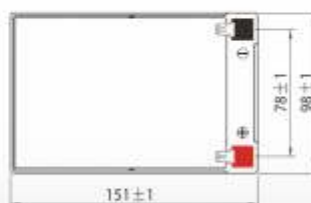
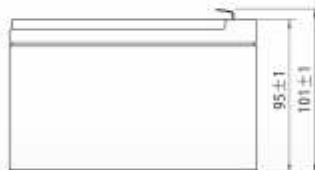
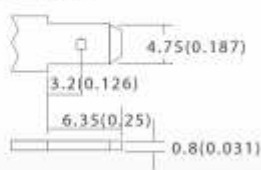
Part Number:	FZA 12-12
Length:	151 ± 2 mm (5.95 inches)
Width:	98 ± 2 mm (3.85 inches)
Container Height:	95 ± 2 mm (3.74 inches)
Total Height (with terminal):	101 ± 2 mm (3.98 inches)
Approx Weight:	Approx 3.30 kg (7.94lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (20HR)	12AH
	Standard Terminal	F1
	Optional Terminal	F2
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	12.0 AH/0.60A	(20hr,1.80V/cell, 25°C / 77°F)
	11.2 AH/1.12A	(10hr,1.80V/cell, 25°C / 77°F)
	10.2 AH/2.04A	(5hr,1.75V/cell, 25°C / 77°F)
	9.2 AH/3.06A	(3hr,1.75V/cell, 25°C / 77°F)
	7.54AH/7.54A	(1hr,1.60V/cell, 25°C / 77°F)
Max Discharge Current	180A (5s)	
Internal Resistance	Approx 14mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 3.6A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F1 Terminal



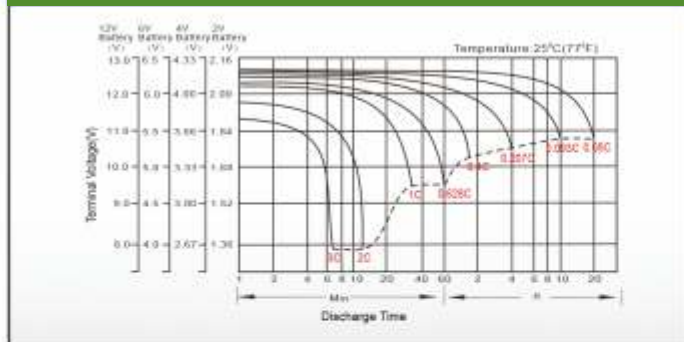
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	22.9	17.5	14.5	12.6	9.72	7.16	6.03	3.57	2.79	2.27	1.85	1.61	1.30	1.08	0.594
1.80V/cell	30.7	22.4	17.6	14.9	11.5	8.33	6.76	3.90	3.00	2.42	1.99	1.72	1.37	1.12	0.600
1.75V/cell	34.6	24.6	19.2	16.0	11.9	8.64	7.07	4.04	3.06	2.48	2.04	1.77	1.40	1.15	0.606
1.70V/cell	38.1	26.9	20.5	16.8	12.4	8.99	7.29	4.14	3.15	2.54	2.09	1.81	1.42	1.17	0.617
1.65V/cell	42.0	29.0	21.8	17.8	13.1	9.21	7.46	4.20	3.28	2.63	2.15	1.85	1.44	1.19	0.625
1.60V/cell	46.3	31.5	23.3	19.0	13.8	9.60	7.54	4.38	3.38	2.71	2.22	1.89	1.45	1.21	0.629

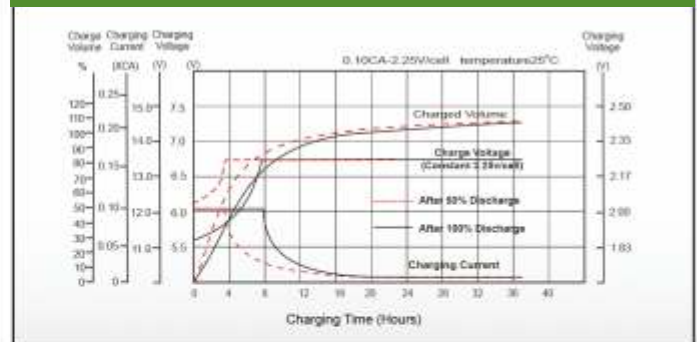
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	41.8	32.4	27.1	23.7	18.5	13.8	11.6	6.93	5.44	4.44	3.63	3.16	2.56	2.14	1.18
1.80V/cell	55.5	40.9	32.3	27.6	21.5	15.9	13.0	7.51	5.82	4.71	3.88	3.37	2.71	2.21	1.19
1.75V/cell	61.2	44.3	34.9	29.4	22.2	16.3	13.5	7.76	5.91	4.80	3.97	3.46	2.75	2.26	1.20
1.70V/cell	65.6	47.1	36.7	30.7	22.9	16.9	13.9	7.94	6.06	4.92	4.06	3.52	2.78	2.31	1.22
1.65V/cell	71.3	50.4	38.7	32.3	24.0	17.2	14.1	8.01	6.29	5.07	4.16	3.59	2.82	2.35	1.23
1.60V/cell	76.8	53.5	40.8	34.1	25.2	17.8	14.2	8.31	6.45	5.21	4.28	3.65	2.84	2.37	1.24

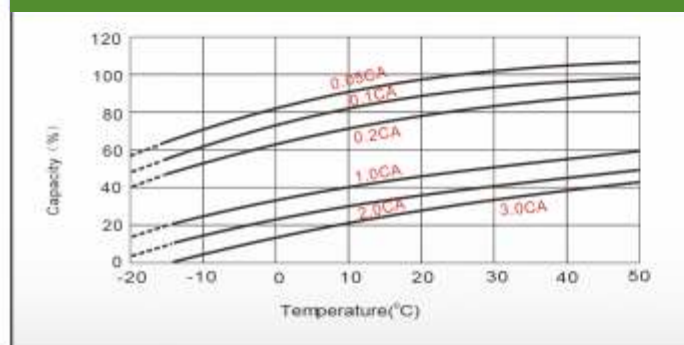
Discharge Characteristics



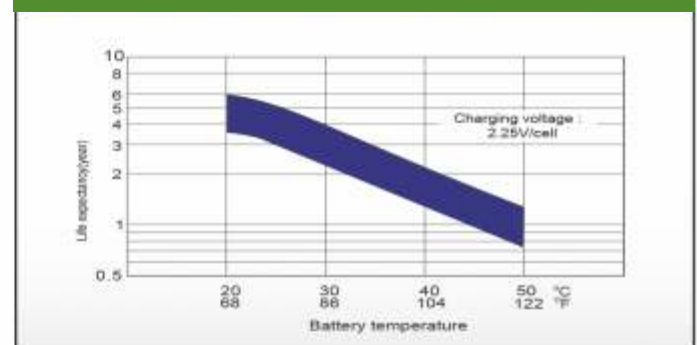
Float Charging Characteristics



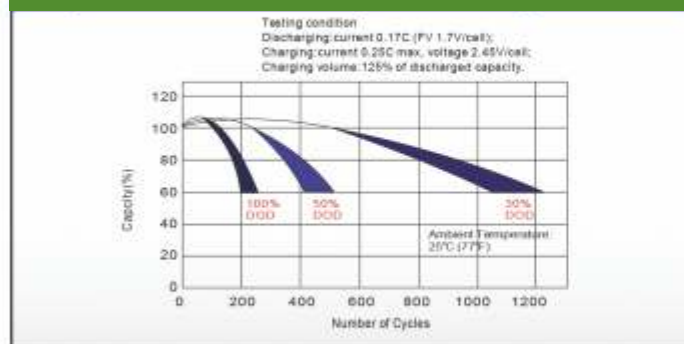
Temperature Effects in Relation to Battery Capacity



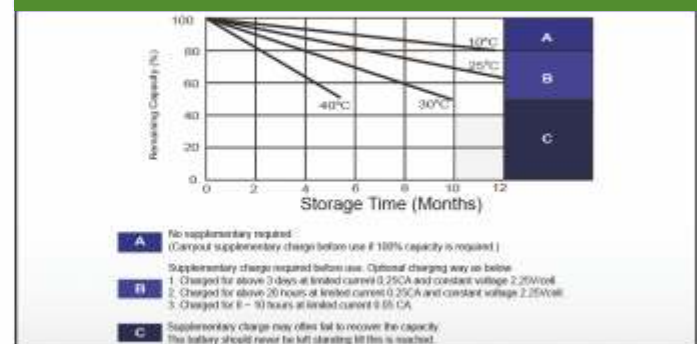
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 18-12

12V 18AH



FZA 18-12



Physical Specification

Part Number:	FZA 18-12
Length:	181.5 ± 2 mm (7.14 inches)
Width:	77 ± 2 mm (3.03 inches)
Container Height:	167.5 ± 2 mm (6.59 inches)
Total Height (with terminal):	167.5 ± 2 mm (6.59 inches)
Approx Weight:	Approx 5 kg (11.73lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (20HR)	18AH
	Standard Terminal	F3
	Optional Terminal	F12
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	18.0 AH/0.90A	(20hr, 1.80V/cell, 25°C / 77°F)
	16.7 AH/1.67A	(10hr, 1.80V/cell, 25°C / 77°F)
	15.3 AH/3.06A	(5hr, 1.75V/cell, 25°C / 77°F)
	13.8 AH/4.59A	(3hr, 1.75V/cell, 25°C / 77°F)
	11.3 AH/11.3A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	270A (5s)	
Internal Resistance	Approx 16mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 5.4A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F3 Terminal



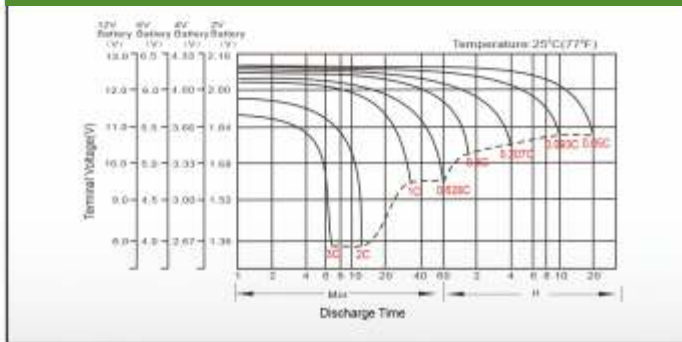
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	34.3	26.0	22.7	19.9	15.6	11.6	9.36	5.56	4.17	3.39	2.87	2.49	1.98	1.63	0.89
1.80V/cell	41.9	30.8	26.5	22.7	17.2	12.7	10.1	5.97	4.39	3.54	2.98	2.57	2.03	1.67	0.90
1.75V/cell	47.5	33.8	28.4	24.1	18.1	13.3	10.6	6.18	4.55	3.64	3.04	2.62	2.07	1.70	0.91
1.70V/cell	52.7	36.8	30.3	25.4	18.9	13.8	10.9	6.34	4.67	3.73	3.11	2.68	2.10	1.72	0.92
1.65V/cell	57.2	39.2	32.2	26.6	19.8	14.3	11.3	6.51	4.75	3.79	3.17	2.72	2.12	1.74	0.93
1.60V/cell	60.9	41.7	34.1	28.0	20.5	14.9	11.7	6.69	4.86	3.87	3.22	2.76	2.15	1.76	0.94

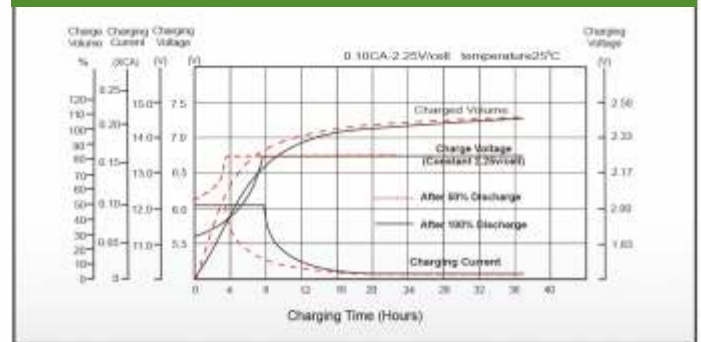
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	65.0	49.8	43.8	38.7	30.5	22.9	18.5	11.1	8.33	6.79	5.77	5.01	3.99	3.31	1.81
1.80V/cell	78.7	58.5	50.9	43.9	33.5	24.9	20.0	11.8	8.74	7.08	5.97	5.16	4.10	3.38	1.82
1.75V/cell	88.4	63.7	54.3	46.4	35.1	26.0	20.9	12.2	9.02	7.24	6.07	5.25	4.15	3.41	1.83
1.70V/cell	97.2	68.9	57.5	48.7	36.6	26.9	21.5	12.5	9.24	7.40	6.20	5.34	4.20	3.45	1.84
1.65V/cell	104.7	72.8	60.7	50.8	38.1	27.8	22.2	12.8	9.39	7.51	6.30	5.41	4.24	3.48	1.86
1.60V/cell	110.4	77.0	63.9	53.2	39.4	28.8	22.9	13.1	9.57	7.65	6.38	5.47	4.28	3.51	1.87

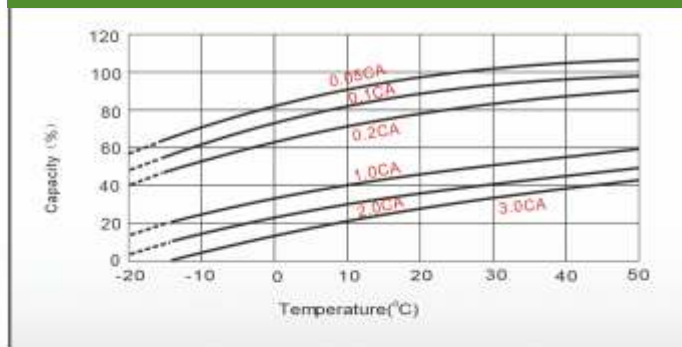
Discharge Characteristics



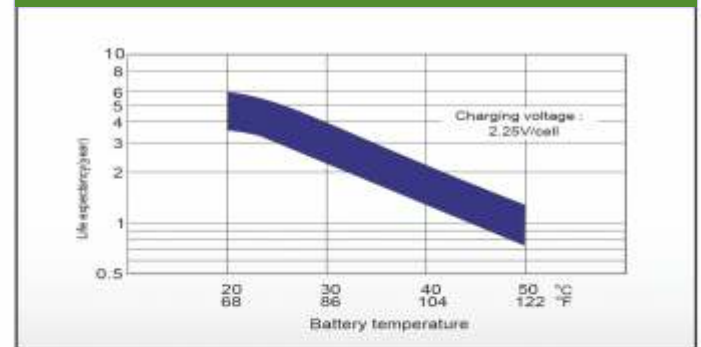
Float Charging Characteristics



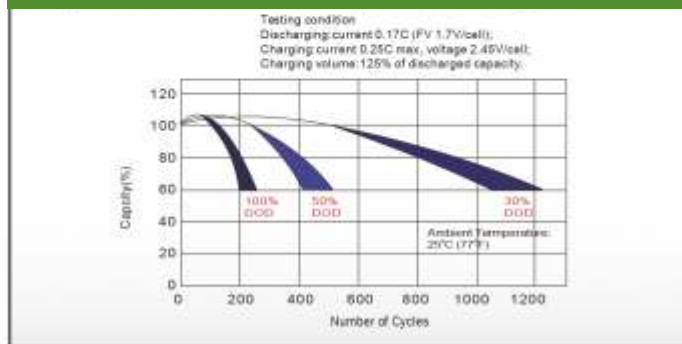
Temperature Effects in Relation to Battery Capacity



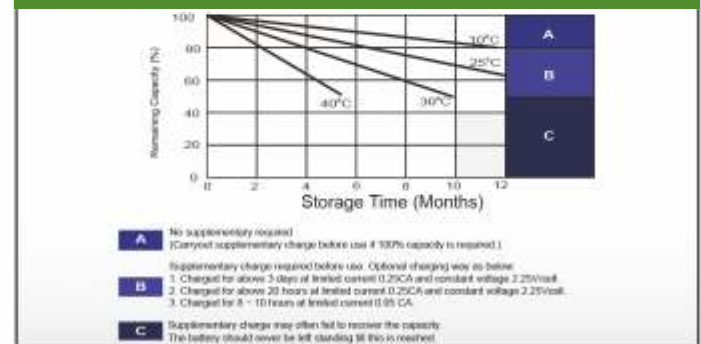
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 26-12

12V 26AH



FZA 26-12



Physical Specification

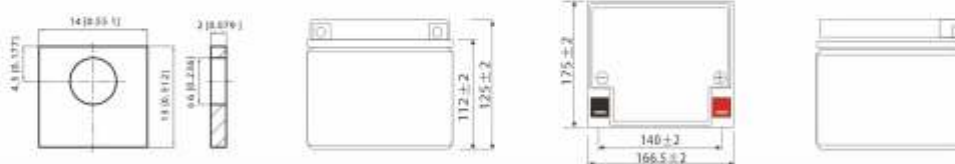
Part Number:	FZA 26-12
Length:	166.5 ± 2 mm (6.52 inches)
Width:	175 ± 2 mm (6.89 inches)
Container Height:	125 ± 2 mm (4.92 inches)
Total Height (with terminal):	125 ± 2 mm (4.92 inches)
Approx Weight:	Approx 8kg (17.6lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	26AH
	Standard Terminal	F3
Container Material	Optional Terminal	F12
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	26.0 AH/1.30A	(20hr, 1.80V/cell, 25°C / 77°F)
	24.2 AH/2.43A	(10hr, 1.80V/cell, 25°C / 77°F)
	22.2 AH/4.44A	(5hr, 1.75V/cell, 25°C / 77°F)
	19.9 AH/6.65A	(3hr, 1.75V/cell, 25°C / 77°F)
	16.4 AH/16.4A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	390A (5s)	
Internal Resistance	Approx 14mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 7.8A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	5 Years	

Dimensions

F3 Terminal



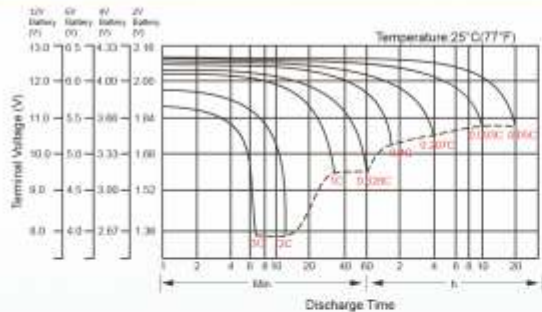
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	59.3	44.8	37.0	31.3	23.5	17.3	13.9	8.41	6.27	5.04	4.24	3.66	2.87	2.38	1.28
1.80V/cell	70.3	50.1	40.3	33.7	25.0	18.2	14.5	8.74	6.48	5.19	4.35	3.75	2.94	2.43	1.30
1.75V/cell	79.5	54.5	43.1	35.6	26.3	19.0	15.1	9.00	6.65	5.31	4.44	3.82	2.99	2.46	1.33
1.70V/cell	87.6	58.4	45.5	37.4	27.4	19.7	15.6	9.23	6.79	5.41	4.52	3.88	3.03	2.50	1.34
1.65V/cell	94.5	61.9	47.7	38.9	28.3	20.3	16.1	9.43	6.92	5.50	4.58	3.93	3.07	2.52	1.35
1.60V/cell	100.6	64.9	49.6	40.2	29.1	20.8	16.4	9.60	7.02	5.57	4.64	3.97	3.10	2.55	1.36

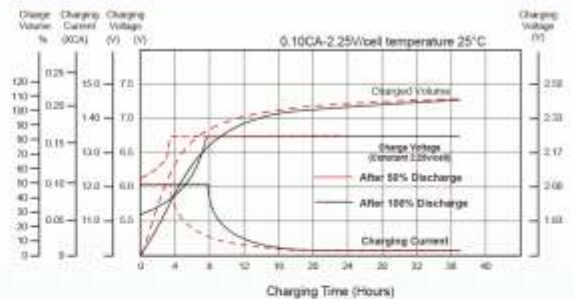
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	112.3	85.7	71.4	61.0	46.1	34.0	27.5	16.7	12.5	10.1	8.52	7.38	5.81	4.81	2.61
1.80V/cell	132.1	95.2	77.3	65.2	48.8	35.7	28.7	17.3	12.9	10.4	8.71	7.53	5.92	4.89	2.63
1.75V/cell	148.1	102.9	82.2	68.7	51.0	37.1	29.6	17.8	13.2	10.6	8.87	7.65	6.00	4.96	2.67
1.70V/cell	161.6	109.4	86.3	71.7	53.0	38.4	30.5	18.2	13.4	10.7	8.99	7.75	6.07	5.00	2.69
1.65V/cell	172.9	115.1	89.9	74.3	54.6	39.4	31.4	18.5	13.7	10.9	9.10	7.83	6.13	5.05	2.71
1.60V/cell	182.3	119.8	92.9	76.5	56.0	40.2	32.0	18.8	13.8	11.0	9.18	7.89	6.17	5.08	2.73

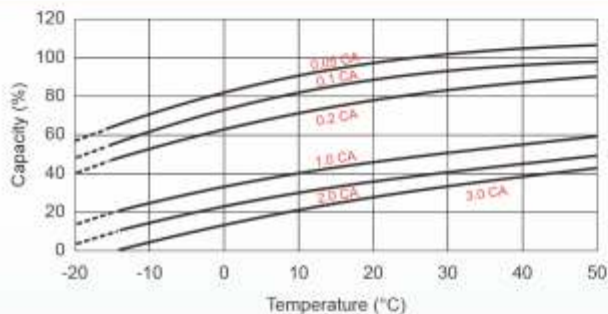
Discharge Characteristics



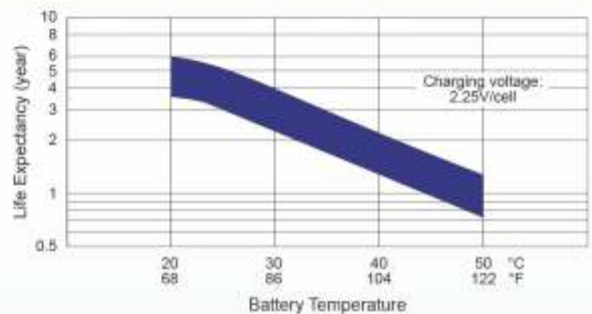
Float Charging Characteristics



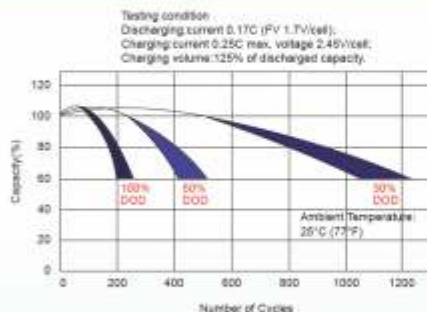
Temperature Effects in Relation to Battery Capacity



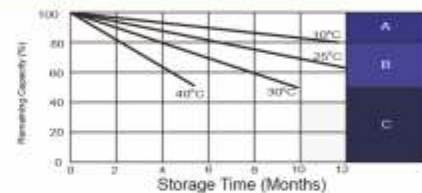
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required
(Control supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging only as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell.
3. Charged for 3 - 10 hours at limited current 0.65 CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should event to self-standing till full is reached.

FZA 33-12

12V 33AH



FZA 33-12



Physical Specification

Part Number:	FZA 33-12
Length:	195 ± 2 mm (7.68 inches)
Width:	130 ± 2 mm (5.12 inches)
Container Height:	164 ± 2 mm (6.46 inches)
Total Height (with terminal):	180 ± 2 mm (7.01 inches)
Approx Weight:	Approx 10kg

Specifications

	Nominal Voltage	12V	
	Nominal Capacity (20HR)	33AH	
Terminal Type	Standard Terminal	F5	
	Optional Terminal	F3 / F2 / F6 / F12	
Container Material	Standard Option	ABS	
	Flame Retardant Option (FR)	ABS (UL94:VO)	
Rated Capacity	33.0 AH/1.65A	(20hr,1.80V/cell, 25°C / 77°F)	
	30.7 AH/3.07A	(10hr,1.80V/cell, 25°C / 77°F)	
	28.1 AH/5.61A	(5hr,1.75V/cell, 25°C / 77°F)	
	25.9 AH/8.65A	(3hr,1.75V/cell, 25°C / 77°F)	
	20.7 AH/20.7A	(1hr,1.60V/cell, 25°C / 77°F)	
Max Discharge Current	495A (5s)		
Internal Resistance	Approx 12mΩ		
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)	
		Charge: 0 ~ 40°C (5 ~ 104°F)	
		Storage: -15 ~ 40°C (5 ~ 104°F)	
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)	
	Cycle Use	Initial Charging Current less than 9.9A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C	
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C	
	Capacity affected by Temperature	40°C (104°F)	103%
		25°C (77°F)	100%
		0°C (32°F)	86%
Design Floating Life at 20°C	10 Years		

Dimensions

F5 Terminal



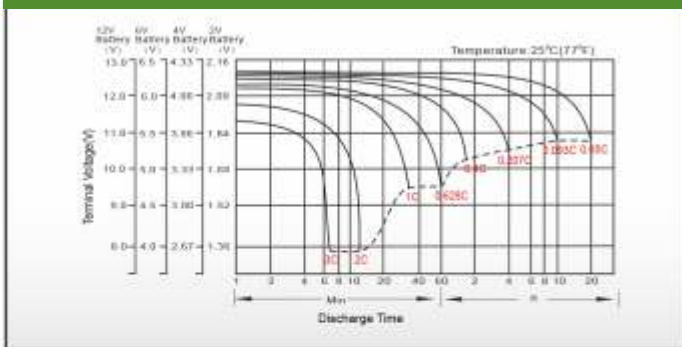
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	62.8	48.3	40.0	34.6	26.7	19.69	16.6	9.81	7.68	6.24	5.09	4.42	3.56	2.98	1.63
1.80V/cell	84.4	61.7	48.3	40.9	31.5	22.9	18.6	10.7	8.26	6.67	5.46	4.74	3.78	3.07	1.65
1.75V/cell	95.1	67.8	52.8	44.0	32.7	23.8	19.4	11.1	8.42	6.81	5.61	4.87	3.84	3.15	1.67
1.70V/cell	104.7	73.9	56.3	46.2	34.1	24.7	20.1	11.4	8.65	7.00	5.75	4.97	3.90	3.21	1.70
1.65V/cell	115.5	79.7	59.9	49.1	35.9	25.3	20.5	11.6	9.02	7.24	5.91	5.08	3.96	3.28	1.72
1.60V/cell	127.4	86.5	64.1	52.3	38.0	26.4	20.7	12.0	9.29	7.46	6.11	5.19	4.00	3.32	1.73

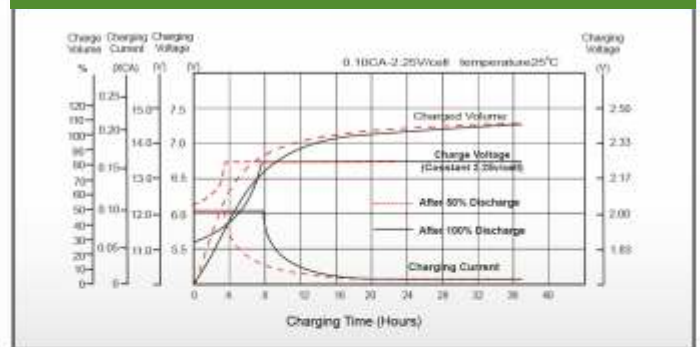
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	114.9	89.1	74.6	65.2	50.9	37.8	32.0	19.1	15.0	12.2	10.0	8.69	7.03	5.89	3.24
1.80V/cell	152.6	112.6	88.9	75.9	59.2	43.7	35.7	20.7	16.0	13.0	10.7	9.28	7.44	6.06	3.26
1.75V/cell	168.4	121.7	95.9	80.9	60.9	44.9	37.1	21.3	16.2	13.2	10.9	9.50	7.55	6.22	3.29
1.70V/cell	180.3	129.6	101.0	84.3	63.1	46.5	38.2	21.8	16.7	13.5	11.2	9.69	7.65	6.34	3.35
1.65V/cell	196.0	138.6	106.6	88.9	66.0	47.2	38.8	22.0	17.3	13.9	11.4	9.87	7.75	6.46	3.39
1.60V/cell	211.2	147.1	112.1	93.7	69.2	49.0	39.0	22.9	17.7	14.3	11.8	10.0	7.81	6.52	3.40

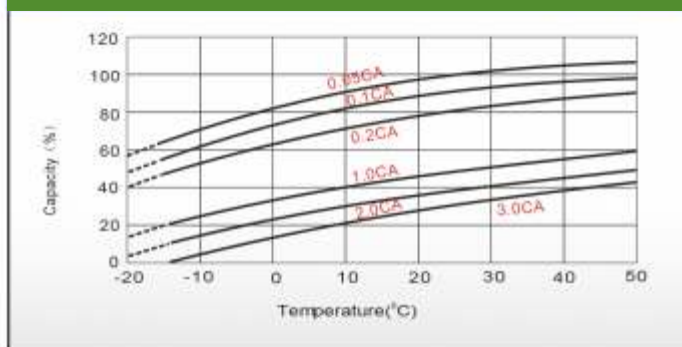
Discharge Characteristics



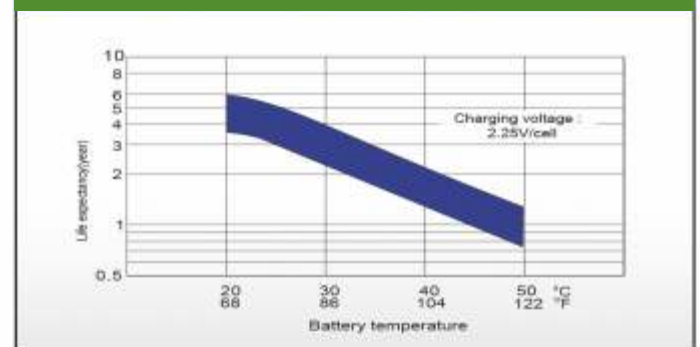
Float Charging Characteristics



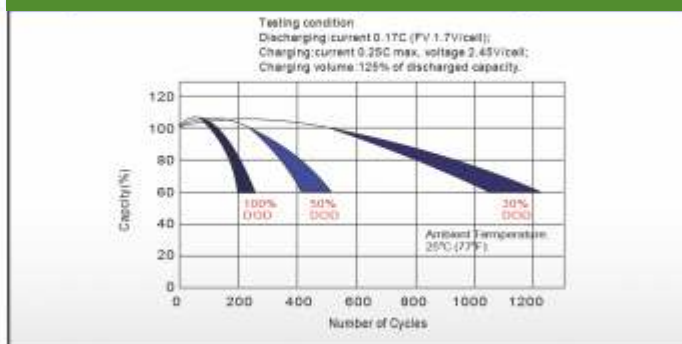
Temperature Effects in Relation to Battery Capacity



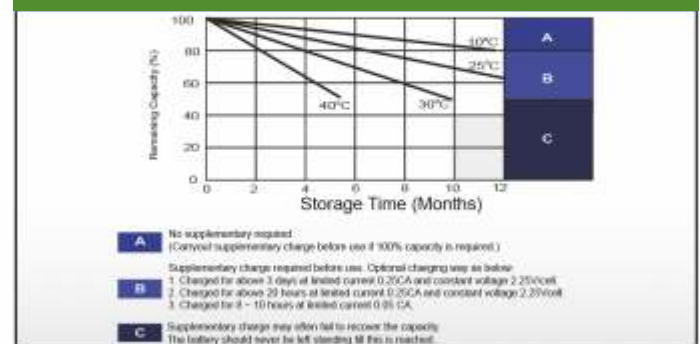
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 40-12

12V 40AH



FZA 40-12



Physical Specification

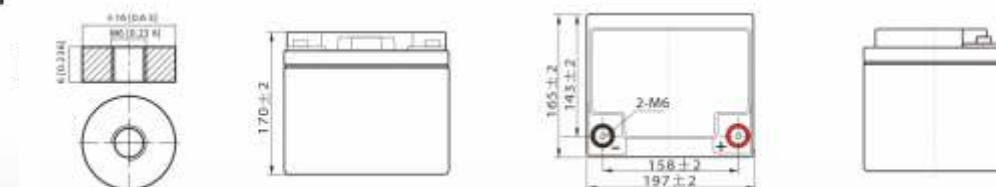
Part Number:	FZA 40-12
Length:	197 ± 2 mm (7.76 inches)
Width:	165 ± 2 mm (6.49 inches)
Container Height:	170 ± 2 mm (6.69 inches)
Total Height (with terminal):	170 ± 2 mm (6.69 inches)
Approx Weight:	Approx 13 kg

Specifications

Terminal Type	Nominal Voltage	12V	
	Nominal Capacity (20HR)	40AH	
	Standard Terminal	F7	
	Optional Terminal	-	
Container Material	Standard Option	ABS	
	Flame Retardant Option (FR)	ABS (UL94:VO)	
Rated Capacity	40.0AH/4.08A	(20hr,1.80V/cell, 25°C / 77°F)	
	38.5 AH/4.00A	(10hr,1.80V/cell, 25°C / 77°F)	
	31.5 AH/6.89A	(5hr,1.75V/cell, 25°C / 77°F)	
	31.2 AH/10.4A	(3hr,1.75V/cell, 25°C / 77°F)	
	24.4 AH/24.4A	(1hr,1.60V/cell, 25°C / 77°F)	
Max Discharge Current	480A (5s)		
Internal Resistance	Approx 9mΩ		
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)	
		Charge: 0 ~ 40°C (5 ~ 104°F)	
		Storage: -15 ~ 40°C (5 ~ 104°F)	
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)	
	Cycle Use	Initial Charging Current less than 12.0A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C	
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C	
	Capacity affected by Temperature	40°C (104°F)	103%
		25°C (77°F)	100%
		0°C (32°F)	86%
Design Floating Life at 20°C	10 Years		

Dimensions

F7 Terminal



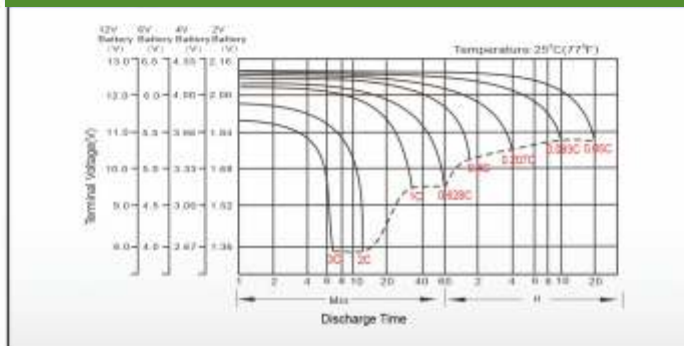
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	68.5	53.8	45.8	38.3	30.4	23.0	18.9	12.0	9.50	7.76	6.25	5.44	4.42	3.78	2.06
1.80V/cell	91.9	68.8	55.3	45.3	35.9	26.8	21.1	13.1	10.2	8.28	6.72	5.84	4.69	4.00	2.08
1.75V/cell	103.6	75.6	60.4	48.7	37.3	27.8	22.1	13.6	10.4	8.47	6.88	6.00	4.77	4.04	2.10
1.70V/cell	114.1	82.4	64.5	51.2	38.8	28.9	22.8	14.1	10.7	8.69	7.06	6.12	4.84	4.08	2.14
1.65V/cell	125.8	88.9	68.6	54.4	40.9	29.6	23.6	14.5	11.2	8.99	7.26	6.26	4.91	4.16	2.17
1.60V/cell	138.8	96.5	73.3	57.9	43.2	30.9	24.4	15.0	11.5	9.27	7.50	6.40	4.96	4.21	2.18

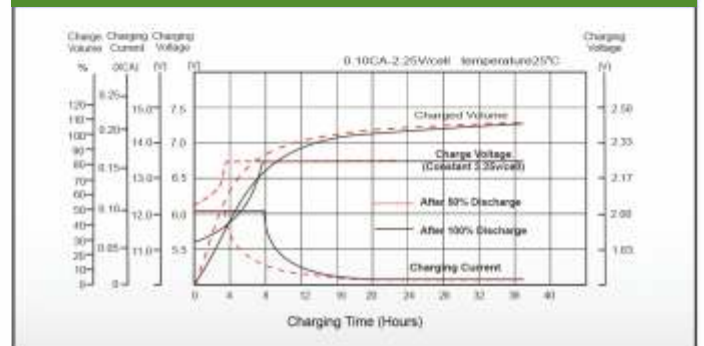
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	125.2	99.4	85.4	72.2	58.0	44.3	36.4	23.3	18.5	15.2	12.3	10.7	8.73	7.47	4.08
1.80V/cell	166.2	125.5	101.8	84.1	67.4	51.1	40.5	25.3	19.8	16.1	13.1	11.4	9.23	7.90	4.11
1.75V/cell	183.4	135.7	109.8	89.6	69.4	52.5	42.2	26.1	20.1	16.4	13.4	11.7	9.36	7.97	4.15
1.70V/cell	196.4	144.6	115.6	93.4	71.8	54.4	43.4	27.1	20.6	16.8	13.7	11.9	9.49	8.05	4.23
1.65V/cell	213.5	154.6	122.0	98.5	75.1	55.3	44.5	27.7	21.4	17.3	14.0	12.2	9.61	8.20	4.28
1.60V/cell	230.0	164.0	128.3	103.8	78.8	57.3	45.9	28.5	22.0	17.8	14.5	12.4	9.69	8.27	4.29

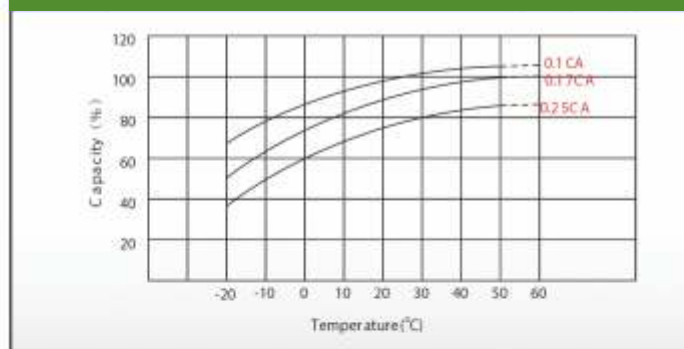
Discharge Characteristics



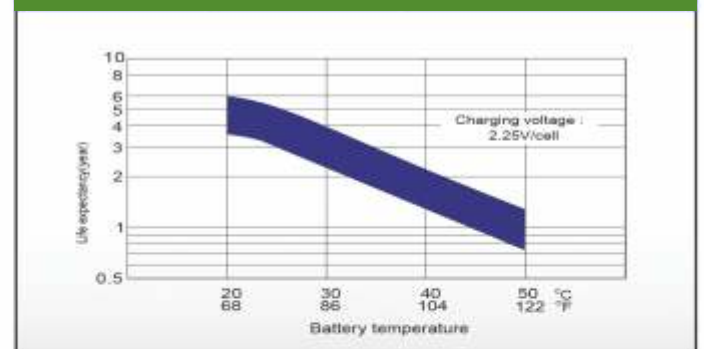
Float Charging Characteristics



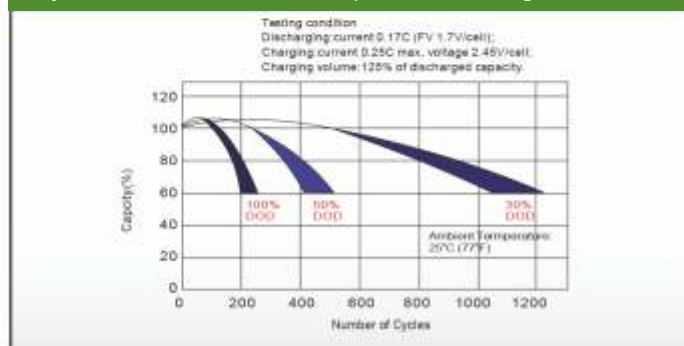
Temperature Effects in Relation to Battery Capacity



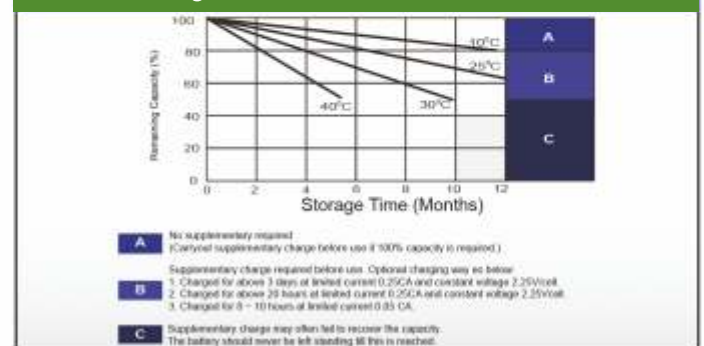
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 55-12

12V 55AH



FZA 55-12



Physical Specification

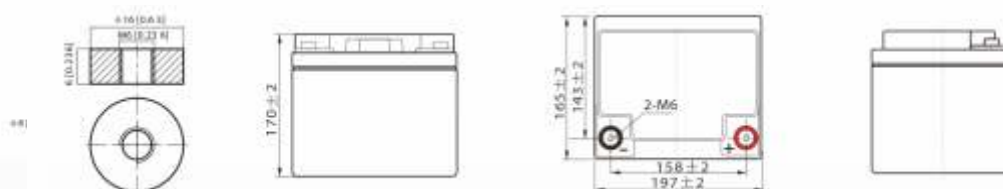
Part Number:	FZA 55-12
Length:	229 ± 2 mm (9.02inches)
Width:	138 ± 2 mm (5.43 inches)
Container Height:	205 ± 2 mm (8.07 inches)
Total Height (with terminal):	226 ± 2 mm (8.90 inches)
Approx Weight:	Approx 17.0 kg (37.5lbs)

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	55AH
	Standard Terminal	F6
Container Material	Optional Terminal	F9/F14
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	UL94:VO
	57.2 AH/2.86A	(20hr, 1.80V/cell, 25°C / 77°F)
	55.0 AH/5.50A	(10hr, 1.80V/cell, 25°C / 77°F)
	47.3 AH/9.46A	(5hr, 1.75V/cell, 25°C / 77°F)
	42.9 AH/14.3A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	33.6 AH/33.6A	(1hr, 1.60V/cell, 25°C / 77°F)
	660A (5s)	
Internal Resistance	Approx 7.5mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 16.5A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F6 Terminal



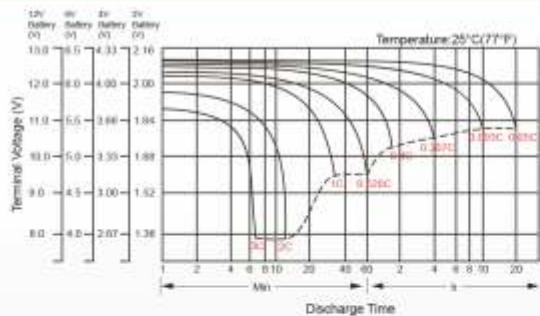
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	94.1	74.0	62.9	52.6	41.8	31.7	25.9	16.5	13.1	10.7	8.60	7.49	6.08	5.19	2.83
1.80V/cell	126.4	94.6	76.0	62.2	49.4	36.8	29.0	18.0	14.1	11.4	9.23	8.03	6.45	5.50	2.86
1.75V/cell	142.5	103.9	83.1	66.9	51.3	38.2	30.4	18.7	14.3	11.6	9.46	8.25	6.56	5.56	2.89
1.70V/cell	156.9	113.3	88.7	70.4	53.3	39.7	31.3	19.4	14.7	11.9	9.71	8.42	6.65	5.61	2.94
1.65V/cell	173.0	122.2	94.3	74.7	56.3	40.7	32.4	20.0	15.3	12.4	9.98	8.61	6.75	5.73	2.98
1.60V/cell	190.8	132.7	100.8	79.6	59.4	42.5	33.6	20.7	15.8	12.7	10.3	8.79	6.82	5.79	3.00

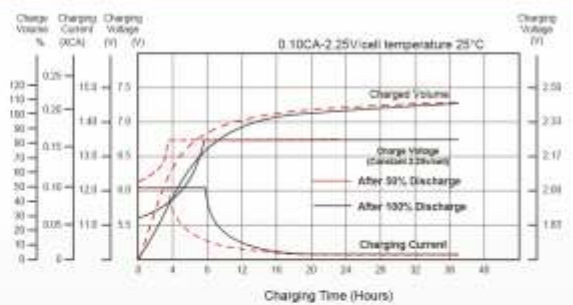
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	172.1	136.7	117.4	99.2	79.7	60.9	50.0	32.1	25.5	20.9	16.9	14.7	12.0	10.3	5.61
1.80V/cell	228.6	172.6	140.0	115.6	92.7	70.2	55.7	34.8	27.2	22.2	18.0	15.7	12.7	10.9	5.66
1.75V/cell	252.2	186.6	151.0	123.1	95.4	72.2	58.0	35.9	27.6	22.6	18.4	16.1	12.9	11.0	5.70
1.70V/cell	270.0	198.8	159.0	128.4	98.7	74.8	59.7	37.3	28.4	23.1	18.9	16.4	13.0	11.1	5.81
1.65V/cell	293.6	212.6	167.8	135.4	103.3	76.0	61.2	38.1	29.4	23.8	19.3	16.7	13.2	11.3	5.88
1.60V/cell	316.3	225.5	176.5	142.7	108.3	78.8	63.1	39.2	30.2	24.5	19.9	17.0	13.3	11.4	5.90

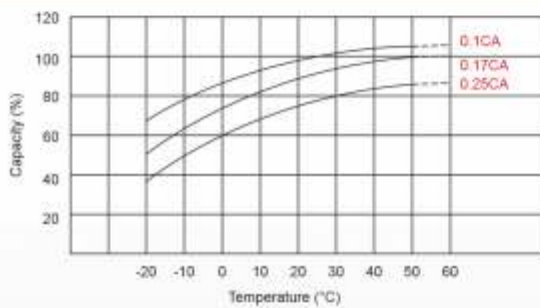
Discharge Characteristics



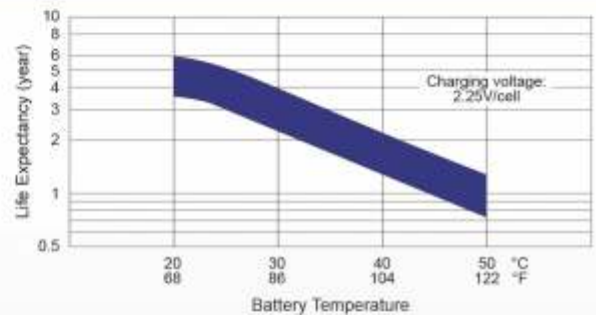
Float Charging Characteristics



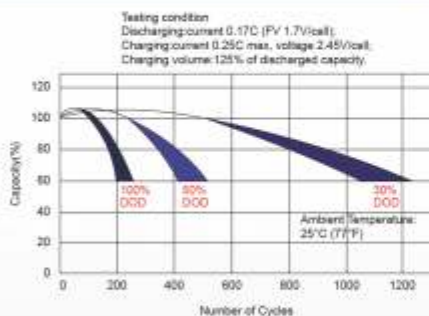
Temperature Effects in Relation to Battery Capacity



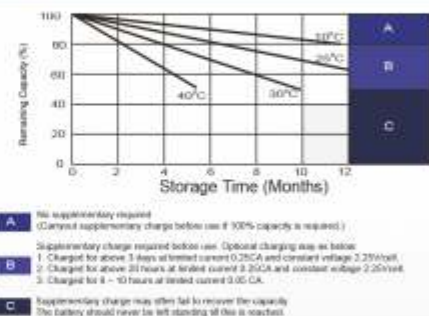
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 65-12

12V 65AH



FZA 65-12



Physical Specification

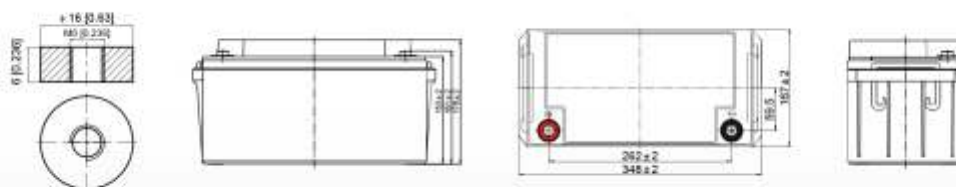
Part Number:	FZA 65-12
Length:	348 ± 2 mm (13.70 inches)
Width:	167 ± 2 mm (6.57 inches)
Container Height:	178 ± 2 mm (7.01 inches)
Total Height (with terminal):	178 ± 2 mm (7.01 inches)
Approx Weight:	Approx 20 kg (42.3lbs)

Specifications

	Normal Voltage	12V
	Normal Capacity (20HR)	65AH
Terminal Type	Standard Terminal	F10
	Optional Terminal	F6
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS(UL94:VO)
Rated Capacity	65.0 AH/3.38A	(20hr, 1.80V/cell, 25°C / 77°F)
	62.5 AH/6.50A	(10hr, 1.80V/cell, 25°C / 77°F)
	56.0 AH/11.2A	(5hr, 1.75V/cell, 25°C / 77°F)
	48.9 AH/16.3A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	780A (5s)	
Internal Resistance	Approx 7.3mΩ	
Discharge Characteristics	Operating Temp. Range:	Discharge: -15 ~ 50°C (5 ~ 122°F) Charge: 0 ~ 40°C (5 ~ 104°F) Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 19.5A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F6 Terminal



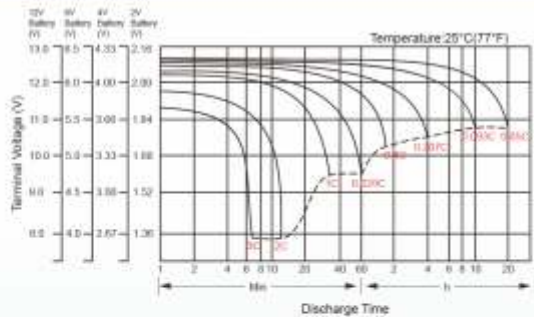
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	119.3	91.7	79.0	68.8	53.2	40.2	32.6	19.7	15.0	12.3	10.5	9.20	7.44	6.26	3.35
1.80V/cell	149.3	107.3	89.9	77.2	58.3	43.5	34.9	21.0	15.8	12.9	11.0	9.59	7.74	6.50	3.40
1.75V/cell	168.4	117.0	98.2	82.7	62.5	46.2	36.9	21.9	16.3	13.2	11.2	9.78	7.86	6.57	3.44
1.70V/cell	185.4	126.4	104.8	87.8	65.3	48.1	38.5	22.6	16.8	13.6	11.5	9.98	7.97	6.63	3.48
1.65V/cell	202.8	136.1	111.4	92.8	68.5	50.3	40.0	23.2	17.2	13.8	11.7	10.2	8.09	6.70	3.52
1.60V/cell	220.0	146.6	119.2	97.7	71.9	52.3	41.6	23.9	17.6	14.1	11.9	10.3	8.20	6.79	3.54

Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5 min	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	226.3	175.5	152.8	133.7	104.3	79.3	64.6	39.1	30.0	24.7	21.1	18.5	15.0	12.7	6.80
1.80V/cell	280.5	203.9	172.6	149.6	113.8	85.4	68.9	41.6	31.5	25.8	22.0	19.3	15.6	13.1	6.88
1.75V/cell	313.5	220.8	187.4	159.4	121.5	90.4	72.7	43.3	32.4	26.4	22.4	19.6	15.8	13.2	6.93
1.70V/cell	342.1	236.6	198.8	168.3	126.3	93.8	75.7	44.6	33.2	26.9	22.8	19.9	15.9	13.3	6.98
1.65V/cell	370.9	253.0	210.1	177.2	132.1	97.8	78.3	45.6	34.0	27.4	23.2	20.2	16.2	13.4	7.06
1.60V/cell	398.3	270.5	223.3	185.6	138.1	101.3	81.2	46.9	34.7	27.9	23.6	20.5	16.3	13.5	7.07

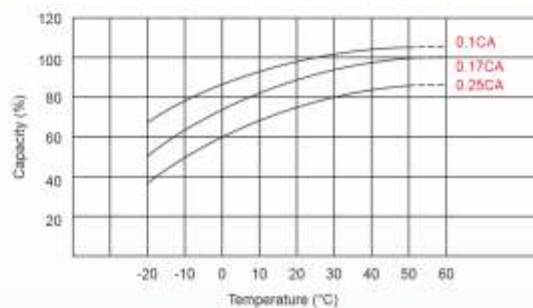
Discharge Characteristics



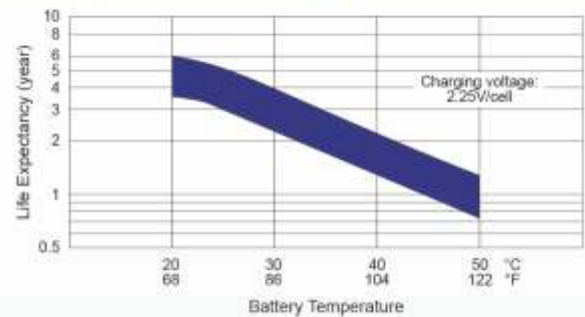
Float Charging Characteristics



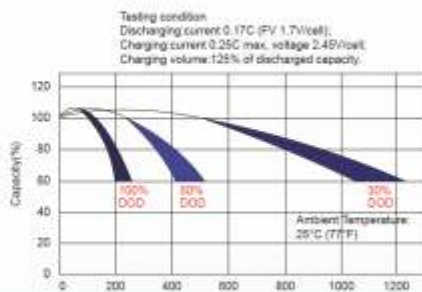
Temperature Effects in Relation to Battery Capacity



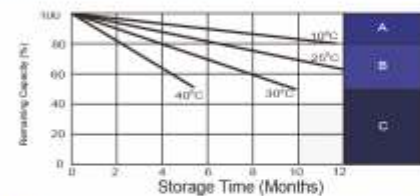
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required
(Chargeup supplementary charge below use if 100% capacity is required.)
- Supplementary charge required before use. Optional charging way as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell;
 2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.25V/cell;
 3. Charged for 8 ~ 10 hours at limited current 0.25-CA.

FZA 80-12

12V 80AH



FZA 80-12



Physical Specification

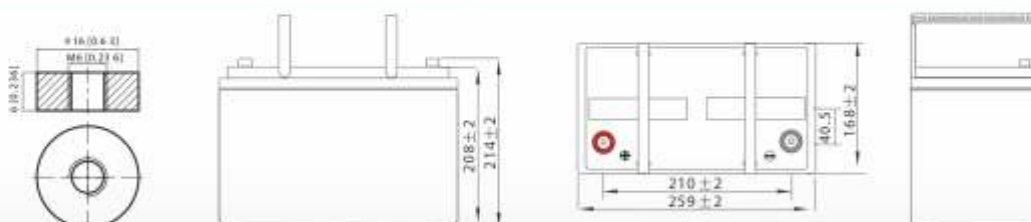
Part Number:	FZA 80-12
Length:	259 ± 2 mm (10.20 inches)
Width:	168 ± 2 mm (6.61 inches)
Container Height:	208 ± 2 mm (8.19 inches)
Total Height (with terminal):	214 ± 2 mm (8.43 inches)
Approx Weight:	Approx 24.0 kg (52.9lbs)

Specifications

	Nominal Voltage	12V	
	Nominal Capacity (10HR)	80AH	
Terminal Type	Standard Terminal	F6	
	Optional Terminal	-	
Container Material	Standard Option	ABS	
	Flame Retardant Option (FR)	ABS (UL94:VO)	
Rated Capacity	83.2 AH/4.16A	(20hr,1.80V/cell, 25°C / 77°F)	
	80.0 AH/8.0A	(10hr,1.80V/cell, 25°C / 77°F)	
	69.0 AH/13.8A	(5hr,1.75V/cell, 25°C / 77°F)	
	62.4 AH/20.8A	(3hr,1.75V/cell, 25°C / 77°F)	
Max Discharge Current	960A (5s)		
Internal Resistance	Approx 6mΩ		
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)	
		Charge: 0 ~ 40°C (5 ~ 104°F)	
		Storage: -15 ~ 40°C (5 ~ 104°F)	
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)	
	Cycle Use	Initial Charging Current less than 24.0A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C	
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C	
	Capacity affected by Temperature	40°C (104°F)	103%
		25°C (77°F)	100%
		0°C (32°F)	86%
Design Floating Life at 20°C	10 Years		

Dimensions

F6 Terminal



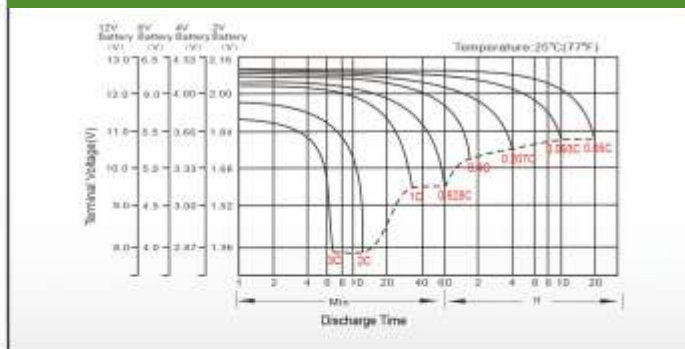
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	136.9	107.6	91.5	76.6	60.9	46.1	37.7	24.0	19.0	15.5	12.5	10.9	8.84	7.55	4.12
1.80V/cell	183.8	137.5	110.6	90.5	71.8	53.6	42.2	26.2	20.4	16.6	13.4	11.7	9.38	8.00	4.16
1.75V/cell	207.2	151.1	120.8	97.4	74.6	55.6	44.2	27.2	20.8	16.9	13.8	12.0	9.54	8.08	4.20
1.70V/cell	228.2	164.7	129.0	102.3	77.6	57.8	45.6	28.3	21.4	17.4	14.1	12.2	9.67	8.16	4.28
1.65V/cell	251.6	177.8	137.2	108.7	81.9	59.3	47.1	29.1	22.3	18.0	14.5	12.5	9.82	8.33	4.34
1.60V/cell	277.5	193.0	146.7	115.8	86.4	61.8	48.8	30.0	23.0	18.5	15.0	12.8	9.92	8.42	4.36

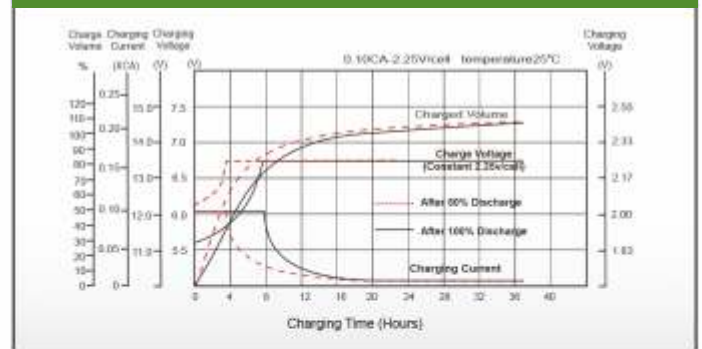
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	250.3	198.8	170.8	144.3	116.0	88.5	72.7	46.7	37.0	30.3	24.5	21.4	17.4	14.9	8.16
1.80V/cell	332.5	251.1	203.6	168.1	134.8	102.2	81.1	50.6	39.6	32.2	26.2	22.9	18.5	15.8	8.23
1.75V/cell	366.9	271.5	219.7	179.1	138.8	105.0	84.4	52.3	40.2	32.8	26.8	23.4	18.7	15.9	8.30
1.70V/cell	392.8	289.2	231.3	186.8	143.6	108.8	86.8	54.2	41.2	33.6	27.4	23.9	19.0	16.1	8.45
1.65V/cell	427.0	309.2	244.0	197.0	150.3	110.5	89.1	55.4	42.8	34.7	28.1	24.3	19.2	16.4	8.55
1.60V/cell	460.1	328.1	256.7	207.5	157.5	114.6	91.7	57.0	43.9	35.6	28.9	24.8	19.4	16.5	8.58

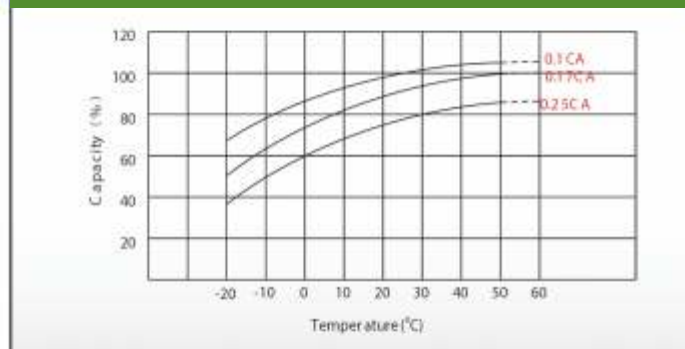
Discharge Characteristics



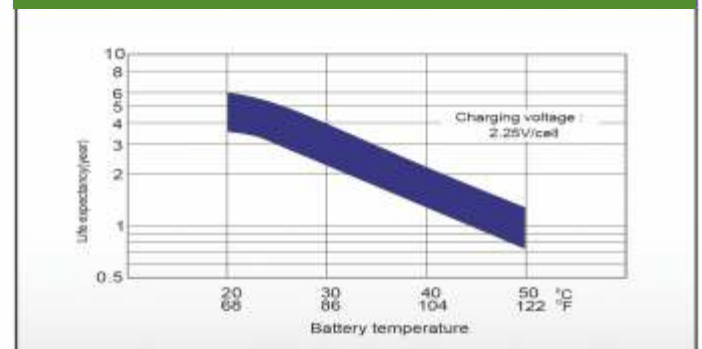
Float Charging Characteristics



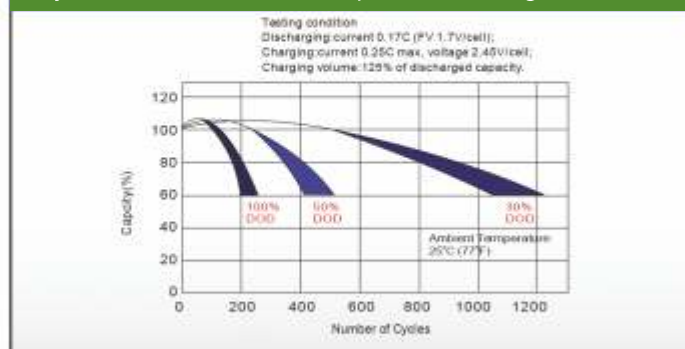
Temperature Effects in Relation to Battery Capacity



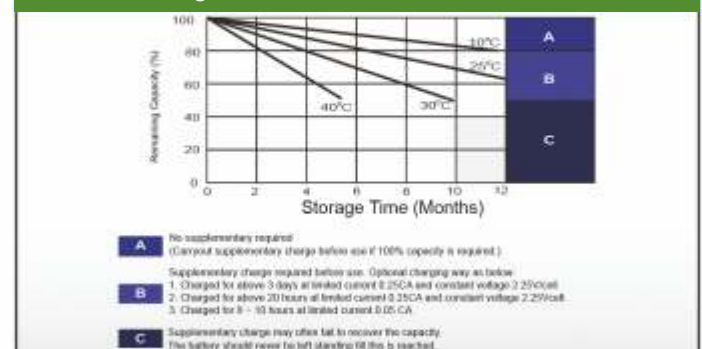
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 100-12

12V 100AH



FZA 100-12



Physical Specification

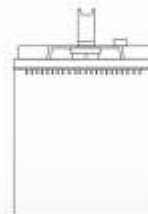
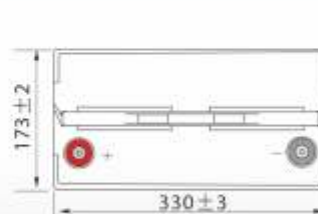
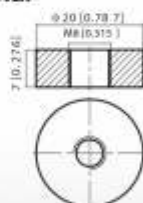
Part Number:	FZA 100-12
Length:	330 ± 2 mm (12.99 inches)
Width:	173 ± 2 mm (6.81 inches)
Container Height:	212 ± 2 mm (8.35 inches)
Total Height (with terminal):	220 ± 2 mm (8.66 inches)
Approx Weight:	Approx 30 kg (66.15lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (10HR)	100AH
	Standard Terminal	F6
	Optional Terminal	F11
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	104.0 AH/5.20A	(20hr, 1.80V/cell, 25°C / 77°F)
	100.0 AH/10.0A	(10hr, 1.80V/cell, 25°C / 77°F)
	88.0 AH/17.6A	(5hr, 1.75V/cell, 25°C / 77°F)
	76.2 AH/25.4A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	1200A (5s)	
Internal Resistance	Approx 4.9mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 30.0A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F11 Terminal



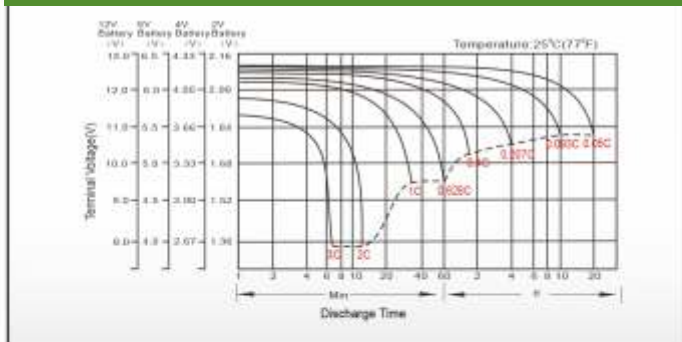
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	208.8	161.4	136.4	117.0	88.4	65.7	53.0	31.3	23.5	19.2	16.4	14.4	11.6	9.65	5.13
1.80V/cell	246.0	180.0	150.8	126.6	94.2	69.6	55.9	33.1	24.6	20.2	17.2	15.0	12.0	10.0	5.20
1.75V/cell	278.4	197.4	162.0	134.7	99.0	72.7	58.0	34.4	25.4	20.7	17.6	15.3	12.2	10.1	5.29
1.70V/cell	318.0	214.8	174.4	143.4	104.6	76.0	60.4	35.3	26.0	21.2	17.9	15.6	12.4	10.2	5.34
1.65V/cell	356.4	232.2	185.6	151.5	110.0	79.2	63.0	36.3	26.7	21.7	18.3	15.9	12.6	10.3	5.40
1.60V/cell	405.6	254.4	197.2	159.9	115.8	82.4	65.1	37.5	27.6	22.2	18.6	16.2	12.7	10.5	5.45

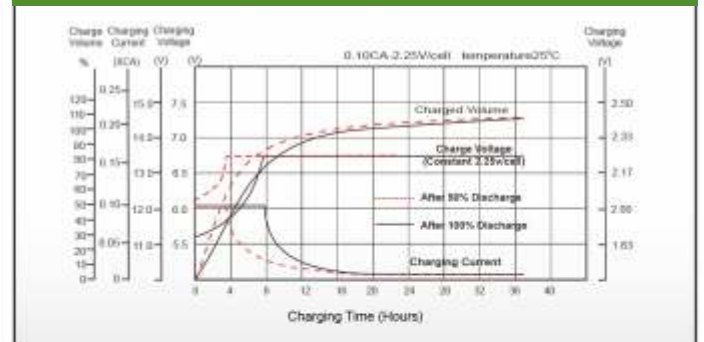
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	381.8	298.1	254.5	220.5	168.5	126.4	102.2	60.8	45.7	37.5	32.2	28.2	22.9	19.1	10.15
1.80V/cell	445.0	328.6	277.6	235.1	176.8	132.7	107.2	63.8	47.7	39.2	33.6	29.4	23.7	19.8	10.29
1.75V/cell	492.9	354.6	294.6	247.8	184.3	137.3	110.8	66.0	49.1	40.1	34.3	29.9	24.0	19.9	10.45
1.70V/cell	547.4	377.1	312.7	261.8	193.6	143.0	115.0	67.6	50.1	41.0	34.8	30.4	24.3	20.1	10.54
1.65V/cell	604.8	403.9	330.2	274.5	201.9	147.7	119.1	69.2	51.3	41.8	35.3	30.8	24.6	20.3	10.64
1.60V/cell	672.4	432.4	345.1	286.6	211.1	152.9	122.4	71.1	52.7	42.6	35.9	31.3	24.8	20.5	10.73

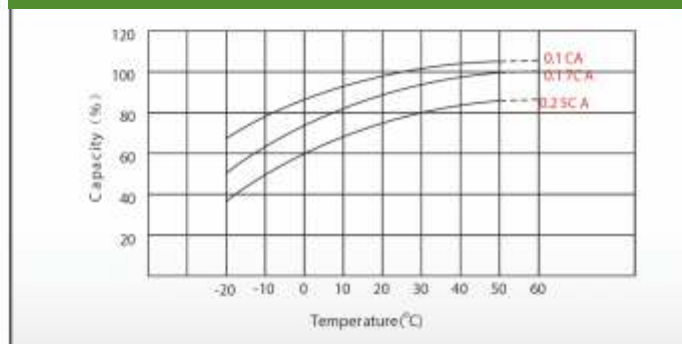
Discharge Characteristics



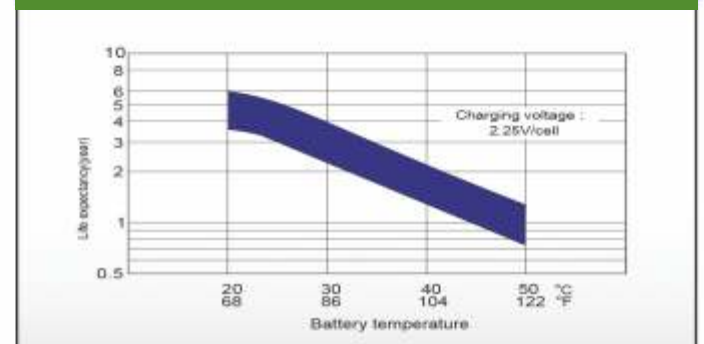
Float Charging Characteristics



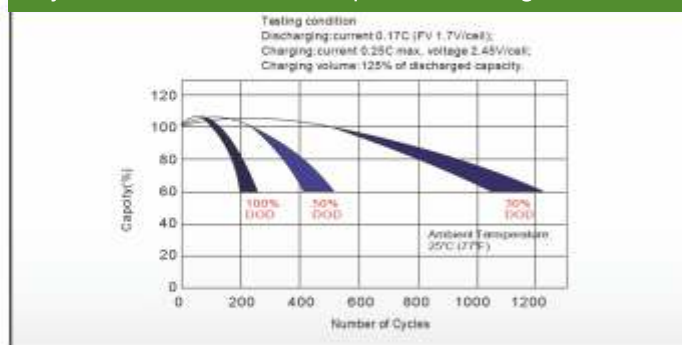
Temperature Effects in Relation to Battery Capacity



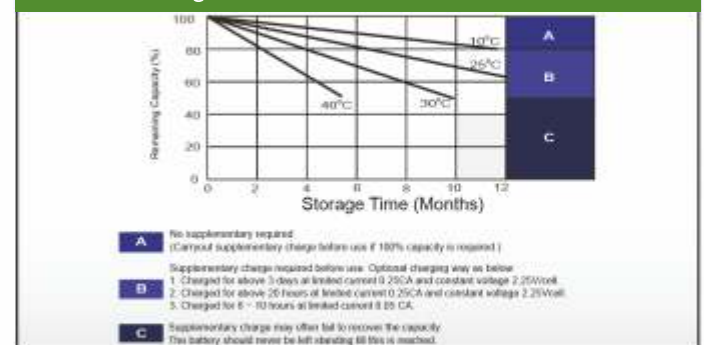
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 120-12

12V 120AH



FZA 120-12



Physical Specification

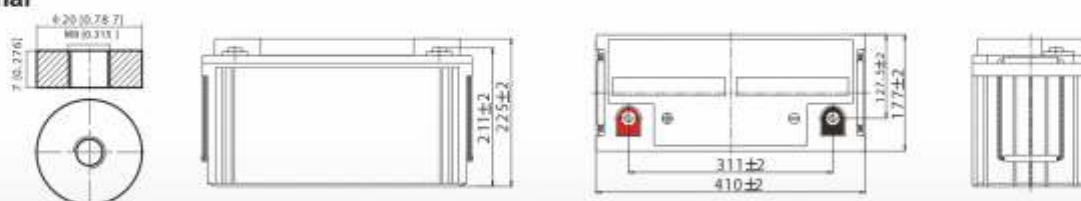
Part Number:	FZA 120-12
Length:	410 ± 2 mm (16.14 inches)
Width:	177 ± 2 mm (6.97 inches)
Container Height:	225 ± 2 mm (8.86 inches)
Total Height (with terminal):	225 ± 2 mm (8.86 inches)
Approx Weight:	Approx 35.0 kg (77.2lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (10HR)	120AH
	Standard Terminal	F11
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	124.8 AH/6.24A	(20hr, 1.80V/cell, 25°C / 77°F)
	120.0 AH/12.0A	(10hr, 1.80V/cell, 25°C / 77°F)
	104.5 AH/20.9A	(5hr, 1.75V/cell, 25°C / 77°F)
	92.1 AH/30.7A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	1300A (5s)	
Internal Resistance	Approx 4.0mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 36.0A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F11 Terminal



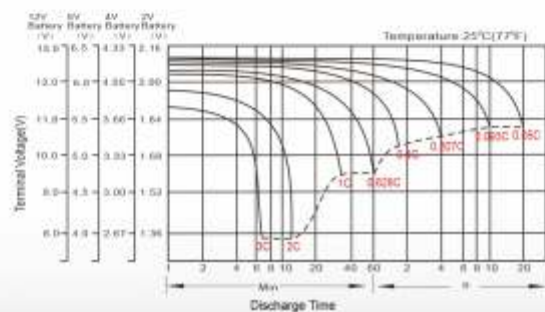
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	250.6	193.7	163.7	140.4	104.2	75.8	60.1	36.5	28.0	23.0	19.5	17.0	13.7	11.5	6.15
1.80V/cell	295.2	216.0	181.0	151.9	111.1	81.0	64.4	39.3	30.0	24.3	20.5	17.8	14.3	12.0	6.24
1.75V/cell	334.1	236.9	194.4	161.6	117.6	85.3	68.0	40.8	30.7	24.8	20.9	18.1	14.5	12.1	6.35
1.70V/cell	381.6	257.8	209.3	172.1	123.6	89.6	71.5	42.4	31.7	25.4	21.3	18.4	14.7	12.2	6.41
1.65V/cell	427.7	278.6	222.7	181.8	130.1	93.9	74.9	43.6	32.5	26.1	21.7	18.8	14.9	12.4	6.47
1.60V/cell	486.7	305.3	236.6	191.9	137.3	98.2	78.1	45.2	33.3	26.6	22.2	19.1	15.1	12.5	6.54

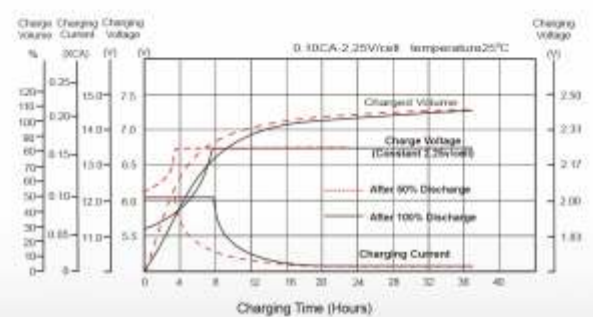
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	458.1	357.8	305.4	264.7	198.5	145.8	116.0	71.0	54.7	45.1	38.3	33.4	27.0	22.8	12.2
1.80V/cell	534.0	394.3	333.1	282.2	208.6	154.4	123.6	75.9	58.2	47.3	39.9	34.9	28.1	23.7	12.3
1.75V/cell	591.5	425.5	353.5	297.3	218.9	161.1	129.9	78.4	59.2	48.1	40.7	35.4	28.4	23.9	12.5
1.70V/cell	656.8	452.5	375.2	314.2	228.8	168.6	136.2	81.3	61.1	49.2	41.4	35.9	28.8	24.1	12.7
1.65V/cell	725.7	484.7	396.3	329.4	238.8	175.2	141.5	83.1	62.4	50.2	42.1	36.5	29.2	24.4	12.8
1.60V/cell	806.8	518.9	414.1	343.9	250.3	182.2	146.9	85.8	63.6	51.2	42.7	37.0	29.5	24.6	12.9

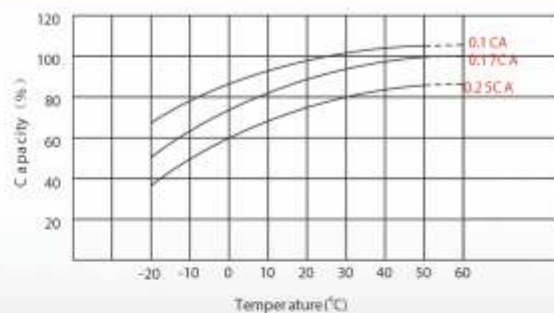
Discharge Characteristics



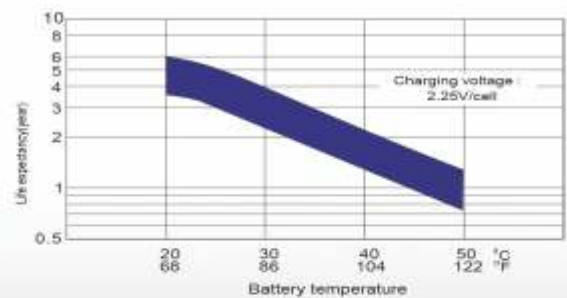
Float Charging Characteristics



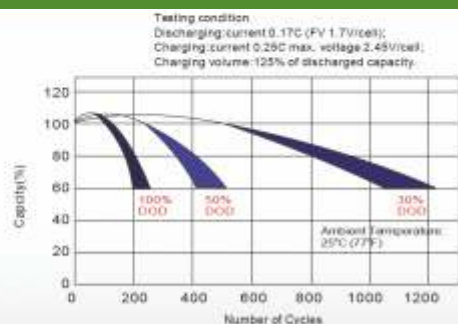
Temperature Effects in Relation to Battery Capacity



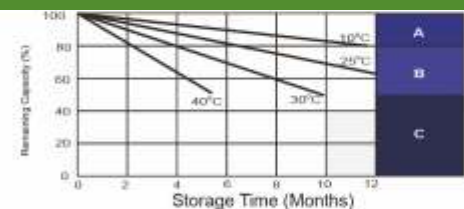
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



- A** No supplementary required (Consume supplementary charge before use if 100% capacity is required)
- B** Supplementary charge required before use. Optional charging only as below:
1. Charged for about 3 days at limited current 0.25CA and constant voltage 2.20V/cell
2. Charged for about 20 hours at limited current 0.25CA and constant voltage 2.20V/cell
3. Charged for 9 ~ 10 hours at limited current 0.05 CA
- C** Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this is reached.

FZA 150-12

12V 150AH



FZA 150-12



Physical Specification

Part Number:	FZA 150-12
Length:	485 ± 2 mm (13.5 inches)
Width:	170 ± 2 mm (6.73 inches)
Container Height:	240 ± 2 mm (10.79 inches)
Total Height (with terminal):	240 ± 2 mm (11.02 inches)
Approx Weight:	Approx 43 kg (93.7lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (10HR)	150AH
	Standard Terminal	F11
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	156.0 AH/7.80A	(20hr, 1.80V/cell, 25°C / 77°F)
	150.0 AH/15.0A	(10hr, 1.80V/cell, 25°C / 77°F)
	130.5 AH/26.1A	(5hr, 1.75V/cell, 25°C / 77°F)
	115.2 AH/38.4A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	1500A (5s)	
Internal Resistance	Approx 3.5mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 45.0A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F11 Terminal



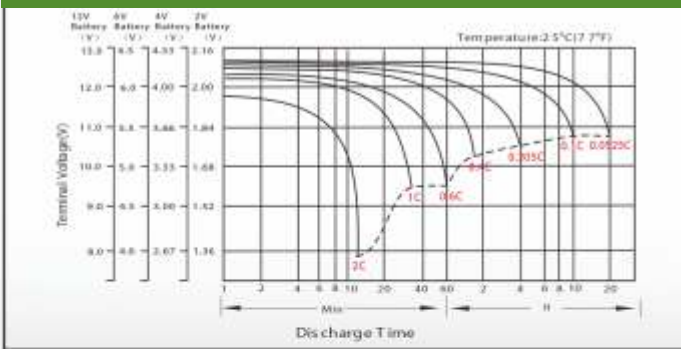
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	259.2	211.5	185.4	156.6	118.5	90.2	74.3	46.5	35.1	28.8	24.4	21.3	17.1	14.4	7.69
1.80V/cell	311.4	243.0	205.8	171.9	129.9	97.4	79.2	49.2	37.6	30.4	25.6	22.3	17.8	15.0	7.80
1.75V/cell	365.4	267.3	223.2	184.5	137.7	102.4	83.1	51.0	38.4	31.0	26.1	22.7	18.1	15.2	7.94
1.70V/cell	401.4	291.6	238.8	198.9	146.7	107.4	86.7	53.0	39.7	31.8	26.6	23.1	18.4	15.3	8.01
1.65V/cell	435.6	315.0	254.4	210.6	154.2	112.2	90.0	54.5	40.7	32.6	27.2	23.5	18.6	15.5	8.09
1.60V/cell	477.0	339.3	269.4	223.2	162.3	117.6	93.9	56.3	41.7	33.3	27.7	23.9	18.9	15.7	8.18

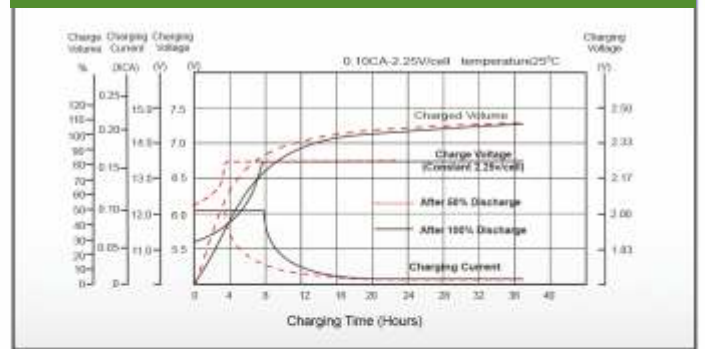
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	473.9	390.7	346.0	295.2	225.9	173.4	143.2	90.3	68.3	56.3	47.9	41.8	33.7	28.5	15.2
1.80V/cell	563.3	443.6	378.9	319.3	243.8	185.8	152.0	94.8	72.8	59.1	49.9	43.6	35.1	29.6	15.4
1.75V/cell	646.9	480.1	405.8	339.4	256.3	193.4	158.7	98.0	74.0	60.1	50.9	44.2	35.5	29.9	15.7
1.70V/cell	690.9	511.9	428.2	363.1	271.5	202.1	165.1	101.7	76.4	61.4	51.7	44.9	36.0	30.2	15.8
1.65V/cell	739.2	547.9	452.6	381.6	283.1	209.3	170.1	103.9	78.0	62.8	52.6	45.6	36.5	30.5	16.0
1.60V/cell	790.7	576.7	471.4	400.0	295.9	218.1	176.5	106.9	79.6	64.0	53.4	46.3	36.8	30.8	16.1

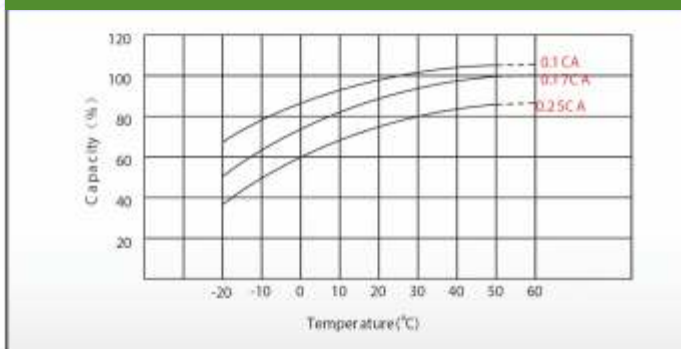
Discharge Characteristics



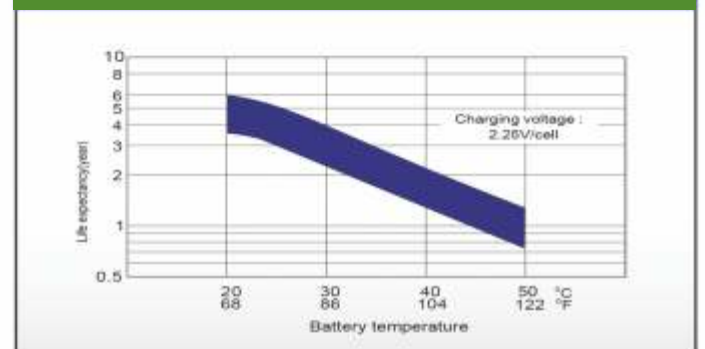
Float Charging Characteristics



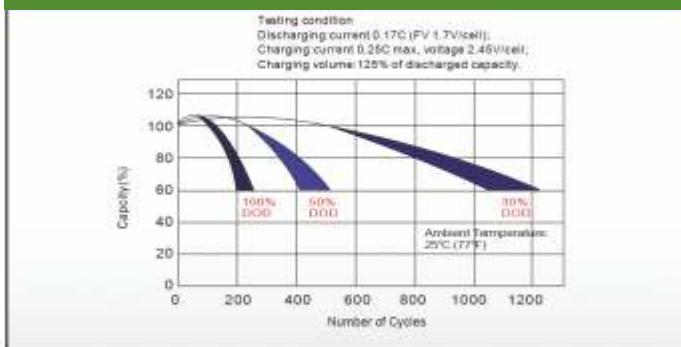
Temperature Effects in Relation to Battery Capacity



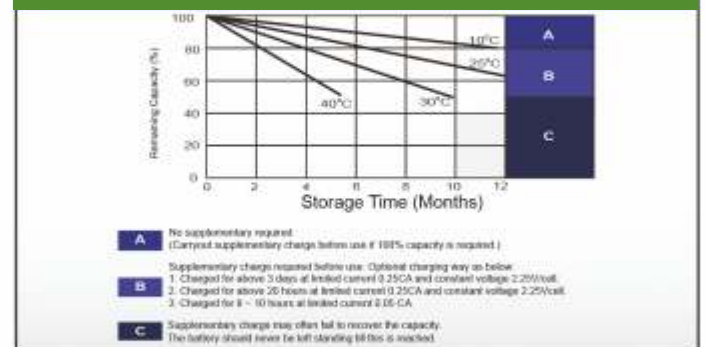
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 200-12

12V 200AH



FZA 200-12



Physical Specification

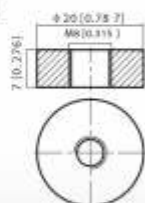
Part Number:	FZA 200-12
Length:	522 ± 2 mm (20.55 inches)
Width:	240 ± 2 mm (9.45 inches)
Container Height:	218 ± 2 mm (8.58 inches)
Total Height (with terminal):	224 ± 2 mm (8.81 inches)
Approx Weight:	Approx 60 kg (134.5lbs)

Specifications

Terminal Type	Nominal Voltage	12V
	Nominal Capacity (10HR)	200AH
	Standard Terminal	F11
	Optional Terminal	-
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	208.0 AH/10.4A	(20hr, 1.80V/cell, 25°C / 77°F)
	200.0 AH/20.0A	(10hr, 1.80V/cell, 25°C / 77°F)
	172.5 AH/34.5A	(5hr, 1.75V/cell, 25°C / 77°F)
	156.0 AH/52.0A	(3hr, 1.75V/cell, 25°C / 77°F)
Max Discharge Current	2000A (5s)	
Internal Resistance	Approx 2.7mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 60.0A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
		25°C (77°F) 100%
		0°C (32°F) 86%
Design Floating Life at 20°C	10 Years	

Dimensions

F11 Terminal



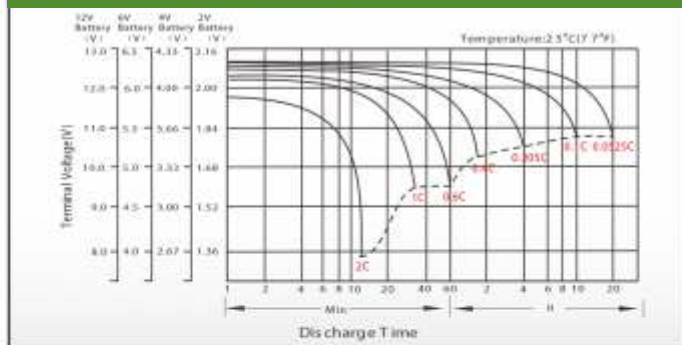
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	342.3	278.4	240.0	204.6	154.8	115.1	94.3	60.1	46.2	37.6	31.3	27.2	22.1	18.9	10.3
1.80V/cell	459.5	343.9	282.4	235.8	179.5	133.9	105.6	65.5	50.6	40.6	33.6	29.2	23.4	20.0	10.4
1.75V/cell	\	377.8	302.0	250.2	189.2	139.0	110.5	68.0	52.0	41.7	34.5	30.0	23.8	20.2	10.5
1.70V/cell	\	411.8	322.5	264.0	196.4	144.5	114.0	70.7	53.5	42.7	35.3	30.6	24.2	20.4	10.7
1.65V/cell	\	444.4	342.9	281.4	204.6	148.1	117.8	72.7	55.8	44.2	36.3	31.3	24.7	20.8	10.8
1.60V/cell	\	476.4	366.7	297.6	216.0	154.4	122.0	75.1	57.5	45.5	37.3	32.0	25.1	21.0	10.9

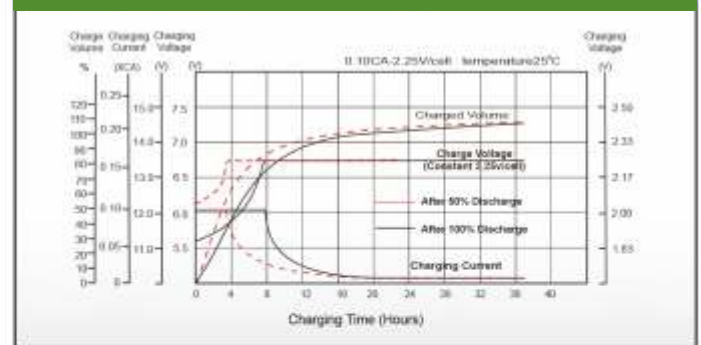
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	625.9	514.3	447.8	385.7	295.0	221.3	181.9	116.6	90.1	73.4	61.3	53.5	43.6	37.4	20.4
1.80V/cell	831.2	627.7	519.9	438.0	336.9	255.4	202.6	126.4	98.1	78.9	65.5	57.2	46.1	39.5	20.6
1.75V/cell	\	678.7	549.2	460.2	352.2	262.5	211.0	130.6	100.5	80.7	67.2	58.6	46.8	39.9	20.7
1.70V/cell	\	723.0	578.2	482.0	363.5	272.0	217.0	135.6	103.1	82.6	68.6	59.7	47.4	40.2	21.1
1.65V/cell	\	773.1	610.1	509.9	375.7	276.3	222.7	138.5	107.0	85.1	70.2	60.8	48.4	41.0	21.4
1.60V/cell	\	809.8	641.7	533.4	393.8	286.4	229.4	142.5	109.8	87.3	72.0	61.9	49.0	41.4	21.5

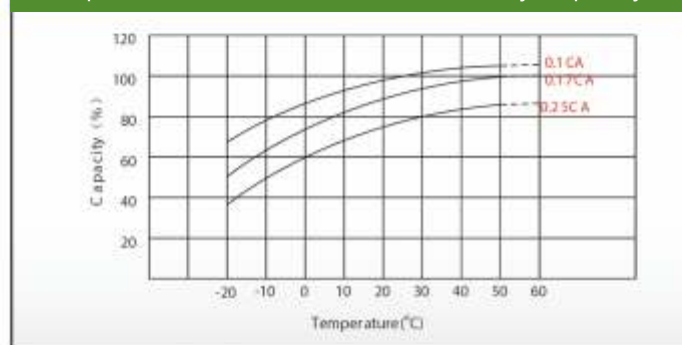
Discharge Characteristics



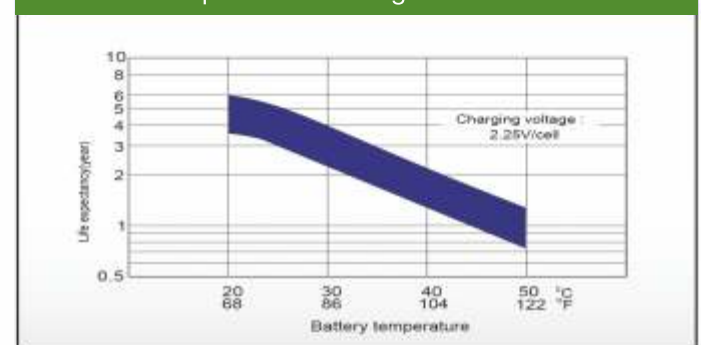
Float Charging Characteristics



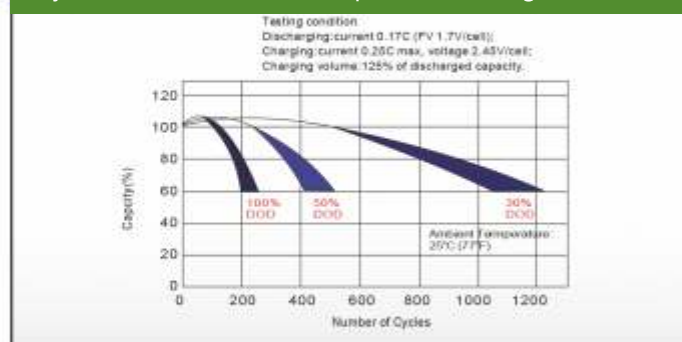
Temperature Effects in Relation to Battery Capacity



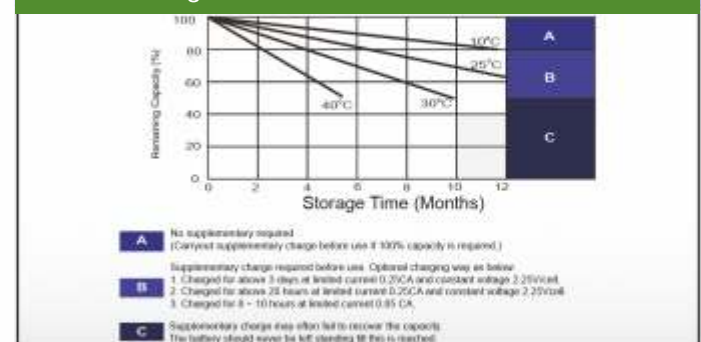
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 14-12 (E-BIKE)

12V 14AH



FZA 14-12



Physical Specification

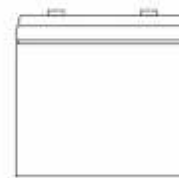
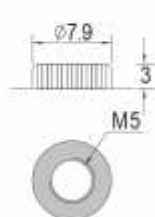
Part Number	FZA 14-12
Length	151.5 ± 2 mm
Width	99.5 ± 2 mm
Container Height	97 ± 2 mm
Total Height (with terminal)	100 ± 2 mm
Approx Weight	4.5 kg

Specifications

	Nominal Voltage	12V
	Nominal Capacity (10HR)	14AH
Terminal Type	Standard Terminal	F1 (Optional Terminal F2)
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	UL94-V0
Rated Capacity	20hr, 1.80V/cell, 25°C	13.9 AH/0.70A
	10hr, 1.80V/cell, 25°C	13.0 AH/1.30A
	5hr, 1.75V/cell, 25°C	11.4 AH/2.28A
	3hr, 1.75V/cell, 25°C	10.3 AH/3.45A
	1hr, 1.60V/cell, 25°C	8.40 AH/8.40A
Max Discharge Current	195A (5s)	
Internal Resistance	Approx 14m Ω	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C
		Charge: 0 ~ 40°C
		Storage: -15 ~ 40°C
	Nominal Operating Temp. Range	25 ± 3°C
	Cycle Use	Initial Charging Current less than 3.9A Voltage 14.4V ~ 15.0V Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V Temp. Coefficient -20mV/°C
	Capacity affect by Temperature	40°C 103%
		25°C 100%
		0°C 86%
Design Floating Life at 20°C	12 Years	

Dimensions

F1 Terminal



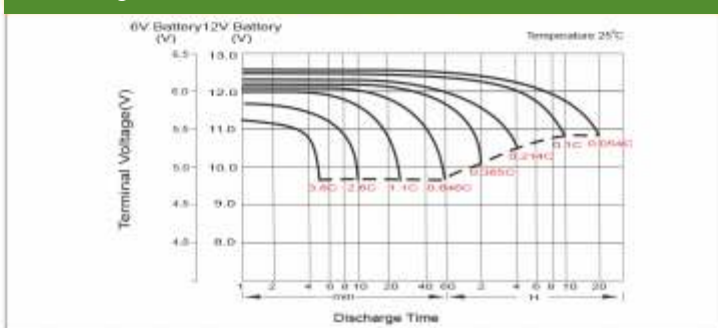
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	19.0	16.0	14.0	10.1	8.00	6.49	4.03	3.14	2.55	2.07	1.81	1.47	1.23	0.690
1.80V/cell	24.3	19.4	16.5	11.9	9.30	7.27	4.40	3.38	2.72	2.22	1.94	1.56	1.30	0.697
1.75V/cell	26.7	21.1	17.8	12.3	9.65	7.61	4.56	3.45	2.78	2.28	1.99	1.59	1.31	0.703
1.70V/cell	29.1	22.6	18.7	12.8	10.0	7.85	4.75	3.54	2.85	2.34	2.03	1.61	1.33	0.716
1.65V/cell	31.4	24.0	19.9	13.5	10.3	8.11	4.88	3.69	2.95	2.40	2.07	1.64	1.35	0.725
1.60V/cell	34.1	25.7	21.2	14.3	10.7	8.40	5.04	3.81	3.04	2.48	2.12	1.65	1.37	0.729

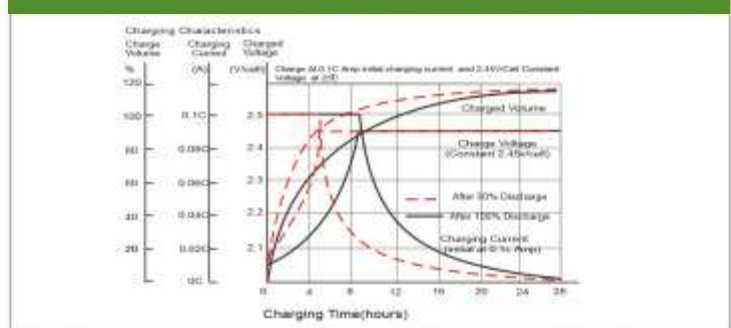
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	35.5	30.2	26.7	19.4	15.5	12.6	7.86	6.14	4.99	4.06	3.57	2.91	2.43	1.381
1.80V/cell	44.8	35.9	31.0	22.6	17.8	14.0	8.52	6.58	5.30	4.35	3.81	3.09	2.57	1.391
1.75V/cell	48.6	38.9	33.1	23.3	18.4	14.6	8.81	6.68	5.41	4.46	3.91	3.14	2.60	1.404
1.70V/cell	52.2	41.2	34.6	24.2	19.1	15.0	9.14	6.85	5.54	4.56	3.98	3.18	2.62	1.429
1.65V/cell	56.0	43.5	36.6	25.4	19.5	15.5	9.37	7.12	5.72	4.68	4.07	3.23	2.67	1.445
1.60V/cell	59.7	46.0	38.6	26.5	20.2	15.9	9.63	7.30	5.87	4.81	4.15	3.25	2.70	1.451

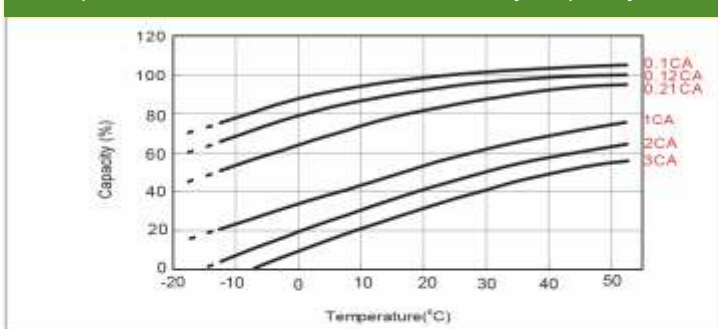
Discharge Characteristics



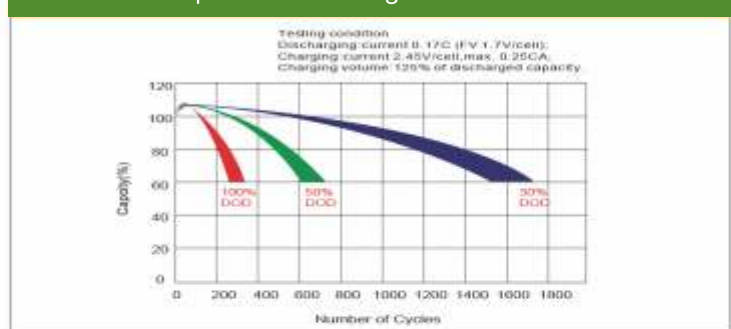
Float Charging Characteristics



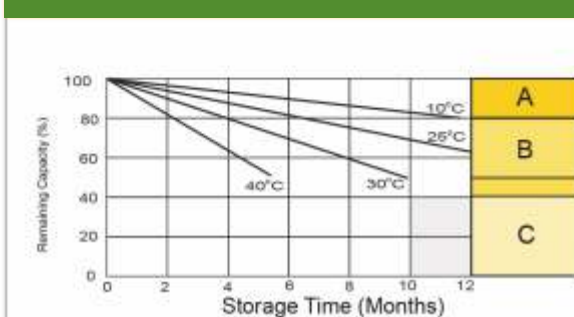
Temperature Effects in Relation to Battery Capacity



Effect of Temperature on Long Term Float Life



Self Discharge Characteristics



- A** No supplementary charge required
(Carry out supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
1.Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2.Charged for above 20hours at limited current 0.25CA and constant voltage 2.45V/cell.
3.Charged for 8~10hours at limited current 0.05CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing till this is reached.

FZA 20-12 (E-BIKE)

12V 20AH



FZA 20-12



Physical Specification

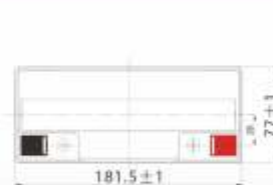
Part Number:	FZA 20-12
Length:	181.5 ± 2 mm (5.95 inches)
Width:	77 ± 2 mm (3.85 inches)
Container Height:	167.5 ± 2 mm (3.74 inches)
Total Height (with terminal):	167.5 ± 2 mm (3.98 inches)
Approx Weight:	Approx 7 kg

Specifications

Terminal Type	Nominal Voltage	12V	
	Nominal Capacity (20HR)	20AH	
	Standard Terminal	F3	
	Optional Terminal	F12	
Container Material	Standard Option	ABS	
	Flame Retardant Option (FR)	ABS (UL94:VO)	
Rated Capacity	20.0 AH/1.00A	(20hr,1.80V/cell, 25°C / 77°F)	
	18.6 AH/1.86A	(10hr,1.80V/cell, 25°C / 77°F)	
	17.0 AH/3.40A	(5hr,1.75V/cell, 25°C / 77°F)	
	15.3 AH/5.10A	(3hr,1.75V/cell, 25°C / 77°F)	
	12.56 AH/12.56A	(1hr,1.60V/cell, 25°C / 77°F)	
Max Discharge Current	300A (5s)		
Internal Resistance	Approx 15mΩ		
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)	
		Charge: 0 ~ 40°C (5 ~ 104°F)	
		Storage: -15 ~ 40°C (5 ~ 104°F)	
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)	
	Cycle Use	Initial Charging Current less than 6.0A.Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C	
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C	
	Capacity affected by Temperature	40°C (104°F)	103%
		25°C (77°F)	100%
		0°C (32°F)	86%
Design Floating Life at 20°C	5 Years		

Dimensions

F3 Terminal



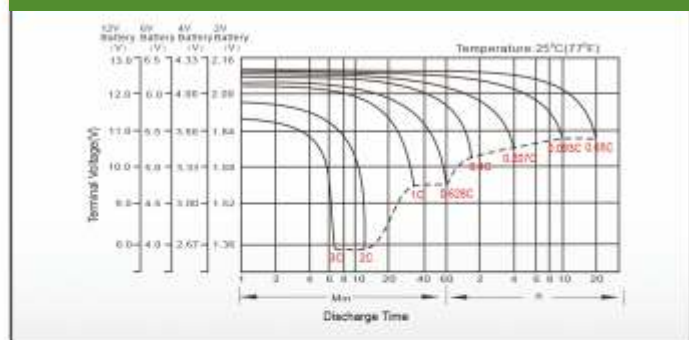
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	38.1	29.2	24.2	20.9	16.2	11.9	10.1	5.95	4.65	3.78	3.09	2.68	2.16	1.80	0.99
1.80V/cell	51.1	37.4	29.3	24.8	19.1	13.9	11.3	6.49	5.01	4.04	3.31	2.87	2.29	1.86	1.00
1.75V/cell	57.6	41.1	32.0	26.6	19.8	14.4	11.8	6.73	5.10	4.13	3.40	2.95	2.33	1.91	1.01
1.70V/cell	63.5	44.8	34.1	28.0	20.7	15.0	12.2	6.90	5.24	4.24	3.49	3.01	2.36	1.95	1.03
1.65V/cell	70.0	48.3	36.3	29.7	21.8	15.4	12.4	7.00	5.47	4.39	3.58	3.08	2.40	1.99	1.04
1.60V/cell	77.2	52.4	38.8	31.7	23.0	16.0	12.6	7.30	5.63	4.52	3.70	3.14	2.42	2.01	1.05

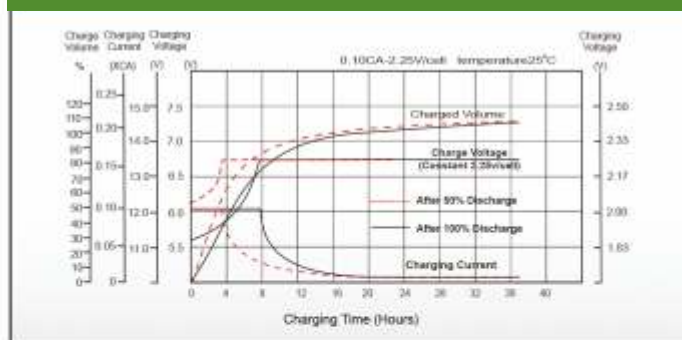
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	69.6	54.0	45.2	39.5	30.9	22.9	19.4	11.6	9.07	7.40	6.05	5.26	4.26	3.57	1.96
1.80V/cell	92.5	68.2	53.9	46.0	35.9	26.5	21.6	12.5	9.71	7.86	6.46	5.62	4.51	3.68	1.98
1.75V/cell	102.0	73.8	58.1	49.0	36.9	27.2	22.5	12.9	9.85	8.00	6.61	5.76	4.58	3.77	2.00
1.70V/cell	109.3	78.6	61.2	51.1	38.2	28.2	23.1	13.2	10.1	8.20	6.77	5.87	4.64	3.84	2.03
1.65V/cell	118.8	84.0	64.6	53.9	40.0	28.6	23.5	13.3	10.5	8.45	6.93	5.98	4.70	3.91	2.05
1.60V/cell	128.0	89.1	67.9	56.8	41.9	29.7	23.6	13.9	10.8	8.69	7.13	6.09	4.73	3.95	2.06

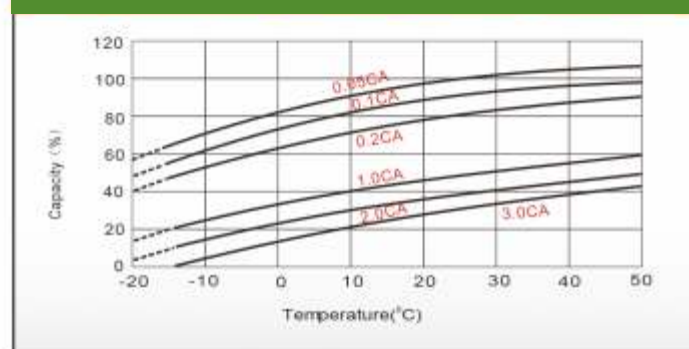
Discharge Characteristics



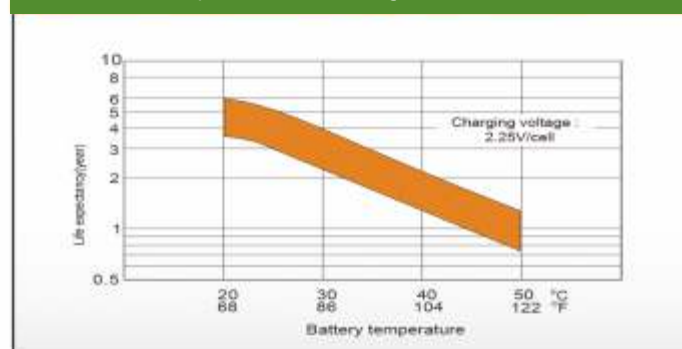
Float Charging Characteristics



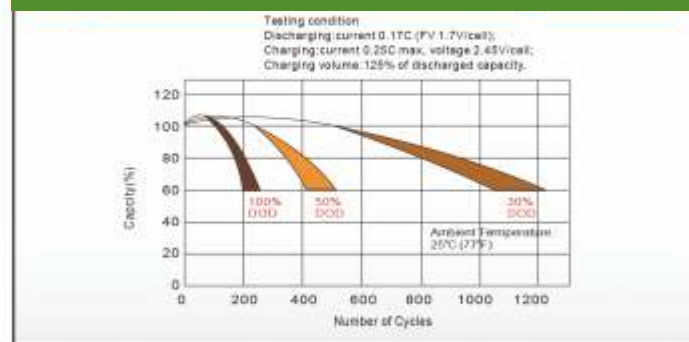
Temperature Effects in Relation to Battery Capacity



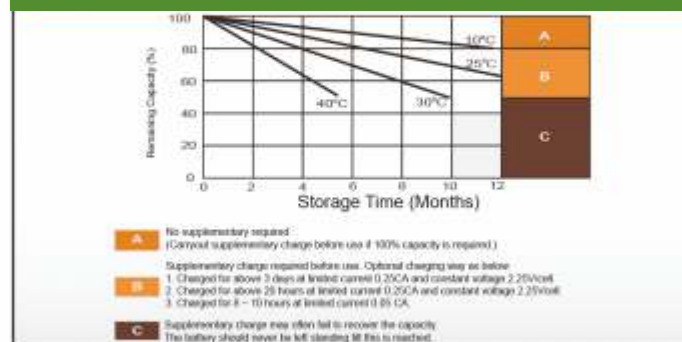
Effect of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



Self Discharge Characteristics



FZA 24-12 (E-BIKE)
12V 24AH



FZA 24-12



Physical Specification

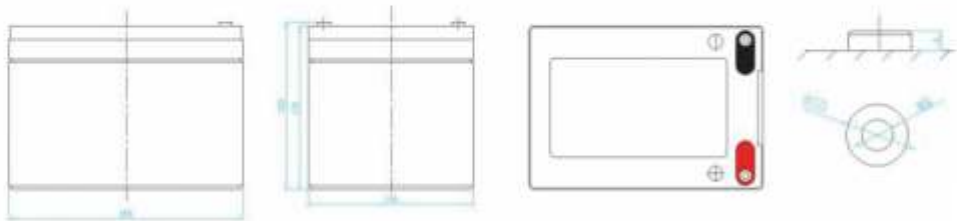
Part Number:	FZA 24-12
Length:	185 ± 2 mm (7.28 inches)
Width:	105 ± 2 mm (4.13 inches)
Container Height:	130 ± 2 mm (5.12 inches)
Total Height (with terminal):	130 ± 2 mm (5.12 inches)
Approx Weight:	Approx 8.0 kg

Specifications

Terminal Type	Normal Voltage	12V
	Normal Capacity (20HR)	24.0AH
	Standard Terminal	F3
Container Material	Optional Terminal	
	Standard Option	ABS
Rated Capacity	Flame Retardant Option (FR)	ABS(UL94:VO)
	25.7 AH/1.29A	(20hr, 1.80V/cell, 25°C / 77°F)
	24.0 AH/2.40A	(10hr, 1.80V/cell, 25°C / 77°F)
	21.0 AH/4.21A	(5hr, 1.75V/cell, 25°C / 77°F)
	19.1 AH/6.36A	(3hr, 1.75V/cell, 25°C / 77°F)
	15.5 AH/15.5A	(1hr, 1.60V/cell, 25°C / 77°F)
Max Discharge Current	360A (5s)	
Internal Resistance	Approx 13.0mΩ	
Discharge Characteristics	Operating Temp. Range	Discharge: -15 ~ 50°C (5 ~ 122°F)
		Charge: 0 ~ 40°C (5 ~ 104°F)
		Storage: -15 ~ 40°C (5 ~ 104°F)
	Nominal Operating Temp. Range	25 ± 3°C (77 ± 5°F)
	Cycle Use	Initial Charging Current less than 7.2A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C
	Standby Use	No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C
	Capacity affected by Temperature	40°C (104°F) 103%
Design Floating Life at 20°C		25°C (77°F) 100%
		0°C (32°F) 86%

Dimensions

F3 Terminal



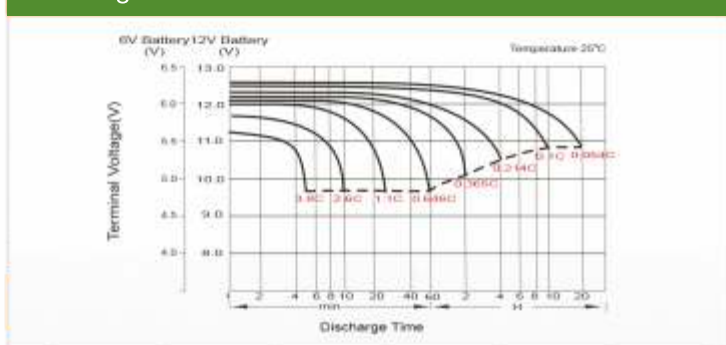
Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	35.1	29.6	25.8	18.6	14.8	12.0	7.44	5.80	4.70	3.82	3.33	2.72	2.27	1.27
1.80V/cell	44.9	36.7	30.5	21.9	17.2	13.4	8.12	6.34	5.02	4.10	3.57	2.88	2.40	1.29
1.75V/cell	49.3	39.0	32.9	22.8	17.8	14.0	8.43	6.36	5.13	4.21	3.67	2.93	2.42	1.30
1.70V/cell	58.8	41.7	34.5	23.7	18.5	14.5	8.78	6.54	5.27	4.32	3.75	2.98	2.45	1.32
1.65V/cell	58.0	44.3	36.7	25.0	19.0	15.0	9.00	6.82	5.45	4.44	3.83	3.02	2.50	1.34
1.60V/cell	63.0	47.4	39.1	26.4	19.8	15.5	9.31	7.02	5.62	4.58	3.91	3.05	2.52	1.35

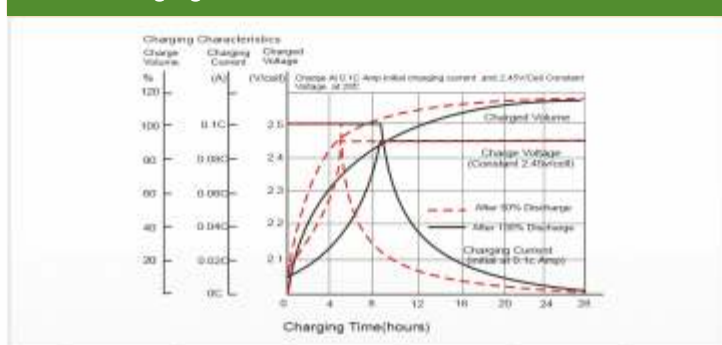
Constant Power Discharge (Watts) at 25°C (77°F)

F.V/Time	10 min	15 min	20 min	30 min	45 min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	65.6	55.7	49.2	35.7	28.6	23.3	14.5	11.3	9.21	7.50	6.58	5.38	4.49	2.55
1.80V/cell	82.7	68.3	57.3	41.6	33.0	25.9	15.7	12.1	9.78	8.03	7.08	5.70	4.75	2.57
1.75V/cell	89.7	71.8	61.1	43.0	34.0	27.0	16.3	12.3	10.0	8.23	7.22	5.79	4.79	2.59
1.70V/cell	98.4	78.1	63.9	44.6	35.3	27.8	16.9	12.6	10.2	8.41	7.38	5.87	4.84	2.64
1.65V/cell	103.3	80.4	67.6	46.8	36.0	28.6	17.3	13.2	10.6	8.64	7.51	5.96	4.93	2.67
1.60V/cell	110.2	84.9	71.2	49.0	37.2	29.4	17.8	13.5	10.8	8.88	7.65	6.01	4.98	2.68

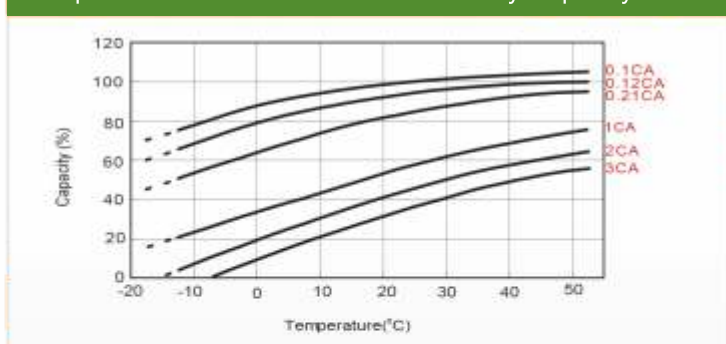
Discharge Characteristics



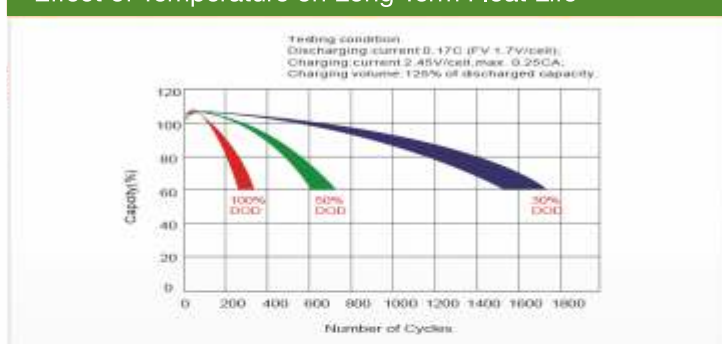
Float Charging Characteristics



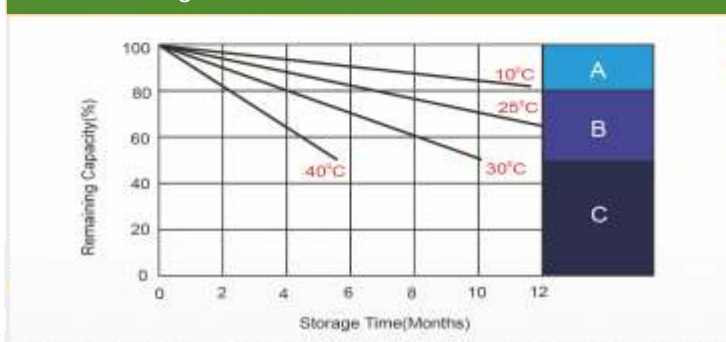
Temperature Effects in Relation to Battery Capacity



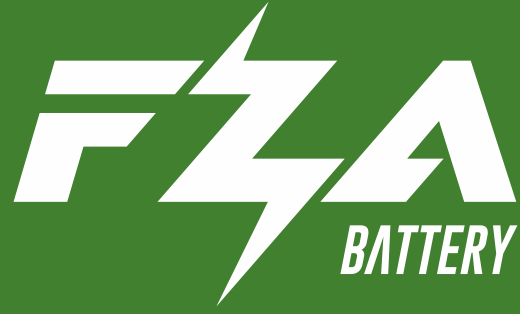
Effect of Temperature on Long Term Float Life



Self Discharge Characteristics



- A** No supplementary charge required
(Carry out supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
2. Charged for above 20hours at limited current 0.25CA and constant voltage 2.45V/cell.
3. Charged for 8~10hours at limited current 0.05CA.
- C** Supplementary charge may often fail to recover the capacity.
The battery should never be left standing till this is reached.



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