

FORCE SERIES
VRLA (12V100 AH)



Product Specification

Nominal Voltage	12V
Nominal Capacity (20HR)	100 AH
Dimensions	Length 307±1mm (12.08 inches)
	Width 169±1mm (6.65 inches)
	Container Height 210±1mm (8.26 inches)
	Total Height (with terminal) 214±1mm (8.42 inches)
Approx Weight	Approx 28.5 kg (62.83 lbs)
	F12 (M8) Terminal
Container & Cover Material	ABS Copolymer (UL-94 HB)
Lead Material	Purity Lead 99.995%
Sulfuric Acid	Distilled Sulfuric Acid (Zero metal content)
Separator	AGM
Rated Capacity	100 AH/5.0A (20hr, 1.75V/cell,25°C/77°F)
	93AH/9.3A (10hr, 1.75V/cell,25°C/77°F)
	84.5AH/16.9A (5hr, 1.70V/cell,25°C/77°F)
	75.9AH/25.3A (3hr, 1.70V/cell,25°C/77°F)
Max. Discharge Current	62.8AH/62.8A (1hr, 1.60V/cell,25°C/77°F)
	1200A (5s)
Internal Resistance	Approx 5 mΩ
Operating Temp.Range	Discharge : -15~50°C (5~122°F)
	Charge : 0~40°C (32~104°F)
Nominal Operating Temp.Range	Storage : -15~40°C (5~104°F)
	25±3°C (77±5°F)
Cycle Use	Initial Charging Current less than 30A. Voltage 14.5V~14.9V at 25°C (77°F) Temp.Coefficient -15mV/°C
	No limit on Initial Charging Current. Voltage 13.5V~13.8V at 25°C (77°F) Temp.Coefficient -10mV/°C
Standby Use	40°C (104°F) 103%
	25°C (77°F) 100%
Capacity affected by Temperature	0°C (32°F) 86%
	Force series batteries may be stored for up to 6 months at 25°C(77°F) and then a freshening charge is required. For higher temperatures the time interval will be shorter.
Self Discharge	

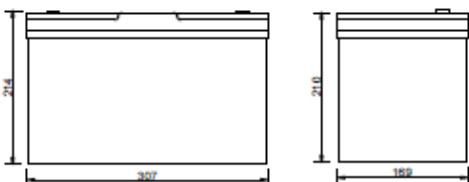
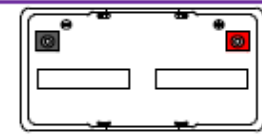
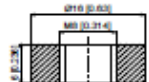
Applications

- All purpose
- Uninterruptible Power Supply (UPS)
- Electric Power System (EPS)
- Emergency backup power supply
- Emergency light
- Railway signal
- Aircraft signal
- Alarm and security system
- Electronic apparatus and equipment
- Communication power supply
- DC power supply
- Auto control system

Dimensions

F12 (M8) Terminal

Unit : mm (inches)



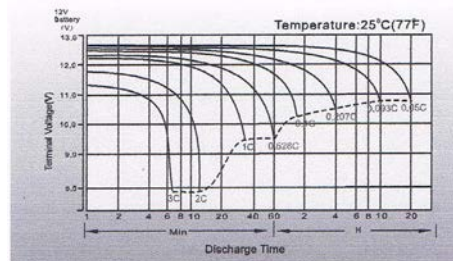
Constant Current Discharge (Ampere) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	270.1	192.1	157.3	131.96	98.04	71.93	56.55	33.66	24.53	19.60	16.40	13.90	10.90	8.98	4.84
1.80V/cell	308.4	206.1	168.8	141.63	101.41	72.43	56.94	33.90	24.71	19.73	16.51	14.17	11.12	9.16	4.91
1.75V/cell	327.2	211.0	172.8	144.96	103.79	74.13	58.28	34.69	25.28	20.20	16.90	14.40	11.29	9.30	5.01
1.70V/cell	350.1	219.0	179.3	150.44	107.71	76.94	60.49	34.72	25.31	20.21	16.92	14.58	11.44	9.42	5.06
1.65V/cell	407.6	250.5	189.9	152.21	108.98	77.84	61.20	35.13	25.60	20.45	17.11	14.75	11.57	9.53	5.12
1.60V/cell	415.2	252.4	191.3	153.33	109.78	78.42	61.65	35.39	25.79	20.60	17.24	14.86	11.66	9.60	5.15

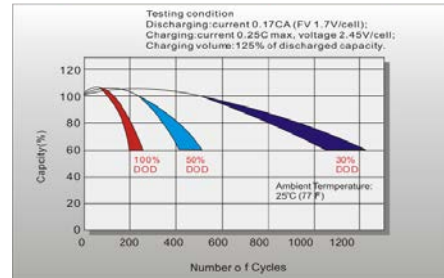
Constant Power Discharge (Watts/cell) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.85V/cell	515.2	366.5	302.9	248.3	186.7	138.3	112.43	67.32	49.87	40.22	34.08	29.64	23.52	18.18	9.83
1.80V/cell	585.9	418.5	321.9	263.9	198.4	147.0	119.49	71.55	53.00	42.06	35.05	30.48	24.00	18.54	9.93
1.75V/cell	605.4	432.4	332.6	272.6	205.0	151.8	123.45	73.92	54.76	43.46	36.22	31.49	24.80	18.79	10.09
1.70V/cell	647.7	462.6	355.9	291.7	209.9	152.1	120.69	69.76	50.55	40.12	33.44	29.85	23.51	18.84	10.16
1.65V/cell	733.7	458.6	352.7	289.1	208.0	150.7	119.63	69.15	50.11	39.77	33.14	29.59	23.86	19.06	10.24
1.60V/cell	747.4	467.1	359.3	294.5	211.9	153.5	121.86	70.44	51.04	40.51	33.76	30.14	24.31	19.20	10.29

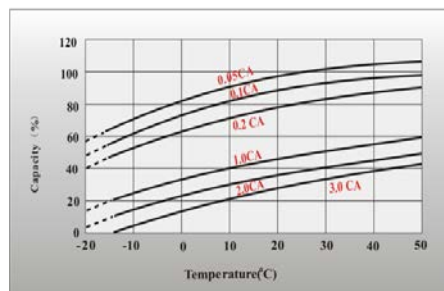
Discharge Characteristics



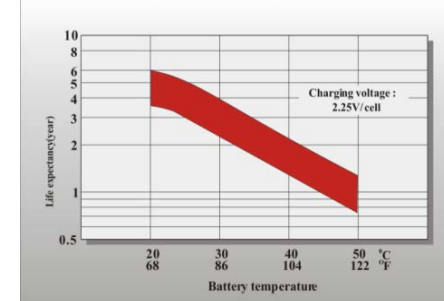
Cycle Life in Relation to Depth of Discharge



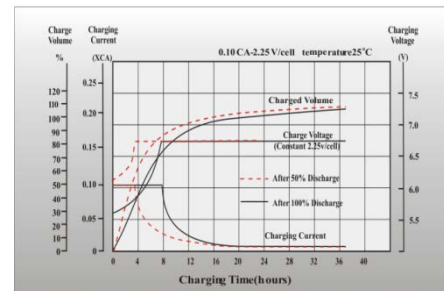
Temperature Effects in Relation to Battery Capacity



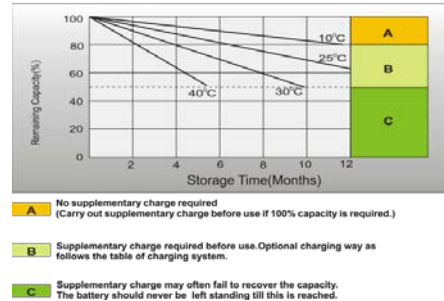
Effect of Temperature on Long Term Float Life



Float Charging Characteristics



Self Discharge Characteristics



State of Charge (SOC)

Open Circuit Voltage (V/cell)	Open Circuit Voltage (12V Battery)	Open Circuit Voltage (6V Battery)	State of Charge (% of full charge capacity)
2.14-2.15	12.84-12.90	6.42-6.46	100
2.12-2.13	12.72-12.78	6.36-6.39	90
2.11	12.66	6.33	80
2.09	12.54	6.27	70
2.07	12.42	6.21	60
2.05	12.30	6.15	50

Charging System

D o D	Current Limit (A)	Constant Voltage (V)	Fully Charged Time (h)
20	0.15C ₁₀	13.5-13.8 vpc (12V)	10
	0.20C ₁₀	6.75-6.9 vpc (6V)	8
50	0.15C ₁₀	13.5-13.8 vpc (12V)	15
	0.20C ₁₀	6.75-6.9 vpc (6V)	12
80	0.15C ₁₀	13.5-13.8 vpc (12V)	16
	0.20C ₁₀	6.75-6.9 vpc (6V)	14
100	0.15C ₁₀	13.5-13.8 vpc (12V)	20
	0.20C ₁₀	6.75-6.9 vpc (6V)	18