

## HR1221W (12V21 Watts/cell)

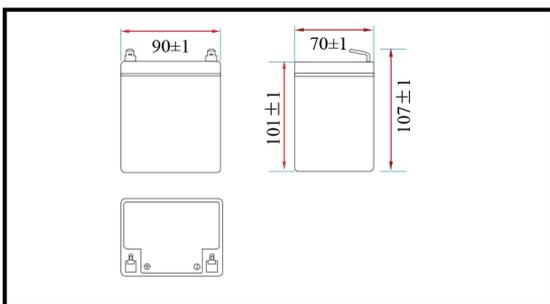
### Valve Regulated Lead Acid Battery



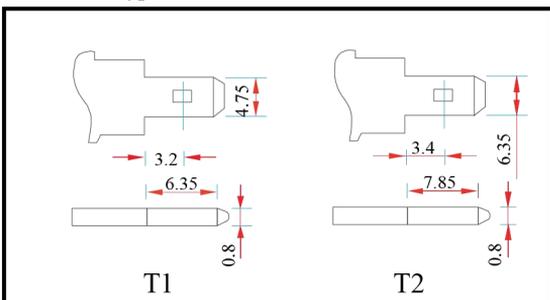
#### Specifications

Nominal voltage		12V (6 cells per unit)
Rated capacity (15min. rate)		21 Watts/cell/1.67V
Dimensions	Length	90±1mm (3.54inch)
	Width	70±1mm (2.76inch)
	Height	101±1mm (3.98inch)
	Total height	107±1mm (4.21inch)
Approx. weight		1.62kg (3.57lbs)±4%

#### Outer dimensions (mm)



#### Terminal type (mm)



#### Construction

Component	Positive plate	Negative plate	Container	Cover	Separator	Electrolyte	Safety valve	Terminal
Raw material	Lead dioxide	Lead	ABS	ABS	AGM	Sulfuric acid	Rubber	Copper

#### Constant current discharge characteristics unit: Ampere/Block (at 25°C, 77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	60min	2h	3h	4h	5h
1.60V/cell	25.14	15.44	11.33	9.06	6.20	4.37	3.58	1.84	1.31	1.05	0.90
1.67V/cell	23.92	14.77	10.92	8.69	6.00	4.23	3.49	1.82	1.29	1.04	0.89
1.70V/cell	23.37	14.33	10.61	8.52	5.89	4.15	3.43	1.81	1.29	1.04	0.89
1.75V/cell	22.38	13.78	10.30	8.23	5.74	4.05	3.36	1.78	1.28	1.03	0.89
1.80V/cell	21.06	13.01	9.79	7.79	5.53	3.90	3.26	1.74	1.24	1.00	0.86

#### Constant power discharge characteristics unit: Watt/Block (at 25°C, 77°F)

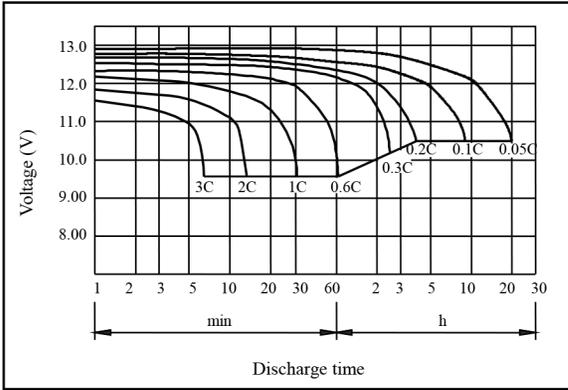
F.V/Time	5min	10min	15min	20min	30min	45min	60min	2h	3h	4h	5h
1.60V/cell	45.91	28.56	22.45	17.89	12.29	8.65	7.08	3.66	2.62	2.11	1.81
1.67V/cell	43.81	27.30	21.00	17.26	11.87	8.38	6.90	3.62	2.60	2.09	1.80
1.70V/cell	42.66	26.57	21.12	16.85	11.66	8.22	6.80	3.60	2.59	2.08	1.79
1.75V/cell	40.87	25.41	20.39	16.33	11.34	8.02	6.66	3.55	2.57	2.07	1.78
1.80V/cell	38.56	23.94	19.26	15.39	10.92	7.73	6.46	3.46	2.50	2.01	1.73

Note 1: Above characteristics data can be obtained within three charge and discharge cycles.

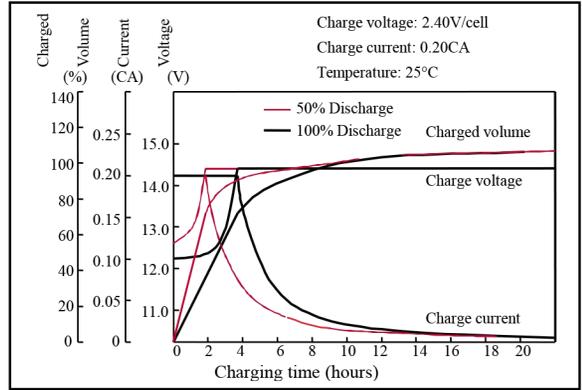
#### Characteristics

Capacity (25°C)	15min. rate	21 Watts/cell /1.67V
	20HR	5Ah/10.5V
Terminal type		T1/T2
Internal resistance (Fully charged, 25°C)		Approx. 27mΩ
Capacity affected by temperature (10HR)	40°C	102%
	25°C	100%
	0°C	85%
	-15°C	65%
Self-discharge (25°C)	3 months	Remaining capacity: 91%
	6 months	Remaining capacity: 82%
	12 months	Remaining capacity: 65%
Nominal operating temperature		25°C± 3°C (77°F± 5°F)
Operating temperature range	Discharge	- 15°C ~ 50°C (5°F ~ 122°F)
	Charge	- 10°C ~ 50°C (14°F ~ 122°F)
	Storage	- 20°C ~ 50°C (-4°F ~ 122°F)
Float charging voltage (25°C)		13.60 to 13.80V Temperature compensation: -18mV/°C/Block
Cyclic charging voltage (25°C)		14.50 to 15.00V Temperature compensation: -30mV/°C/Block
Maximum charging current		1.68A
Maximum discharge current		75A (5 sec.)
Design life	5 years for floating (25°C)	
	Eurobat (20°C): 3-5 years, standard commercial	

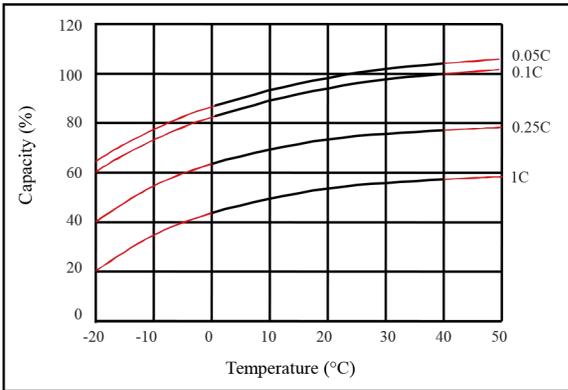
## Discharge characteristics (25°C)



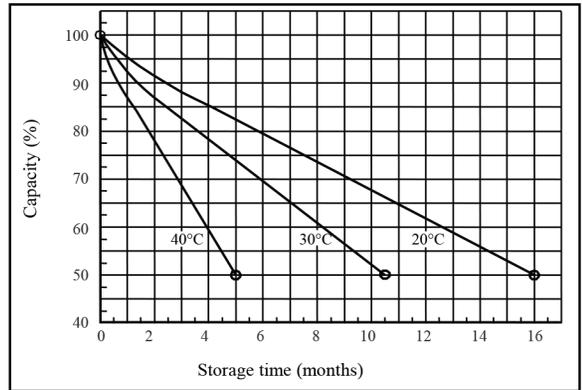
## Charging characteristics (25°C)



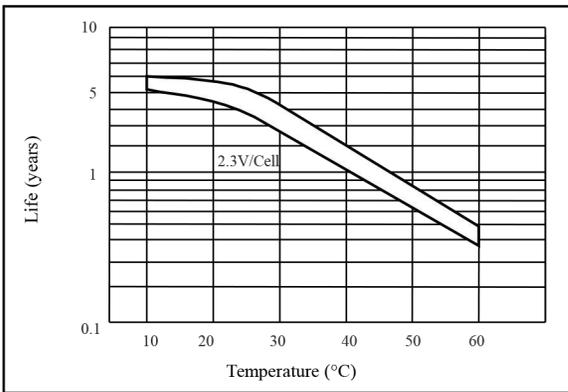
## Temperature effects on capacity



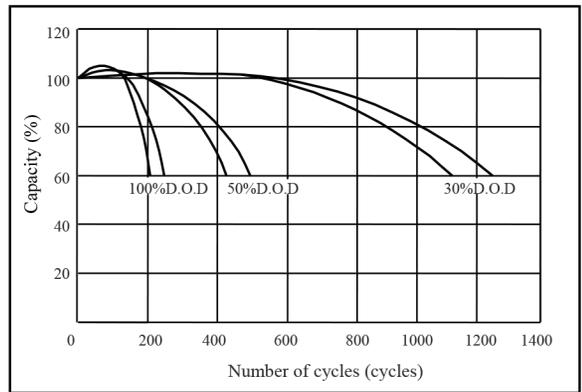
## Self-discharge characteristics



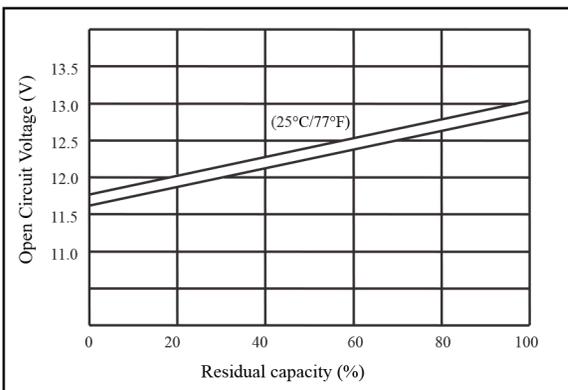
## Floating life on temperature



## Cycle life on D.O.D (25°C)



## Relationship for OCV and capacity (25°C)



## Relationship for charging voltage and temperature

