



The world's leading battery brand



# HRL SERIES-LONG LIFE BATTERIES

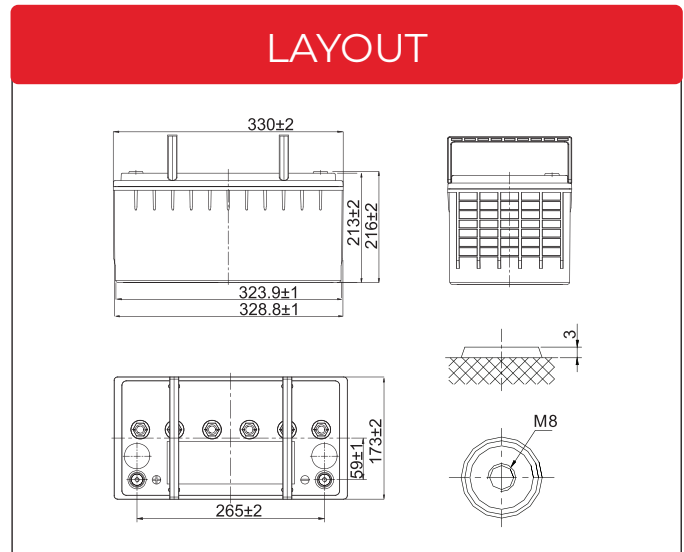
HRL 12400W



www.starmaxbatteries.com

# HRL Series

## HRL 12400W



## General Features

- ✓ **High quality AGM separator:** Extend cycle life and prevent micro short circuit
- ✓ **PbCaSn alloy for plate grids:** Less gassing, less self-discharging
- ✓ **Unique vent valve design:** Reduce water losing and prevent air/spark going inside

## Applications

- ✓ UPS
- ✓ Hospitals & Testing Laboratories
- ✓ Emergency Power Supply
- ✓ Industrial Process Control Facilities
- ✓ Banks & Financial Markets
- ✓ Data & Network Operation Centers

## Standards

- ✓ Compliance with IEC 60896 and YD/T 3427 standards
- ✓ CE, UL, IEC Cer tified
- ✓ Manufactured in Starmax, ISO 45001, ISO 9001 and ISO 14001 certified production facilities



# SPECIFICATIONS

Rated Voltage	12V		
Nominal Rate	(W <sub>15</sub> ,1.67V/cell)	400W/cell	
Nominal Capacity	(C <sub>20</sub> ,1.75V/cell)	100Ah	
Dimensions	Length	330±2mm (13.0 inches)	
	Width	173±2mm (6.81 inches)	
	Container height	213±2mm (8.39 inches)	
	Total height	216±2mm (8.50 inches)	
Approx. weight	30.2kg (66.6 lbs)		
Terminal	M8		
Container material	ABS: UL 94 HB or V-0		
Rated capacity (25°C)	100.0 Ah	C10(10.0A,1.80V/cell)	
	96.8 Ah	C8(12.1A,1.80V/cell)	
	88.0 Ah	C5(17.6A,1.75V/cell)	
	77.4 Ah	C3(25.8A,1.75V/cell)	
	67.7 Ah	C1(67.7A,1.60V/cell)	
Max. discharge current	1000A (5s)		
Internal resistance (25°C)	Approx 3.5mΩ		
Operating temp. range	Discharge	-20~55°C (4~131°F)	
	Charge	-20~40°C (-4~104°F)	
	Storage	-15~50°C (5~122°F)	
Nominal operating temp. range	25±3°C (77±5°F)		
Max.Charging Current(25°C)	25.0A		
Charge voltage(25°C)	<b>Charge voltage</b>		<b>Temp. Coefficient</b>
	Float	2.25~2.30V/cell	-3mV/cell/°C
	Equalization	2.30~2.40V/cell	-4mV/cell/°C
Effect of temp. to Capacity	40°C (104°F)		106%
	25°C (77°F)		100%
	0°C (32°F)		86%
Self discharge	≤3%/month @ 25°C		

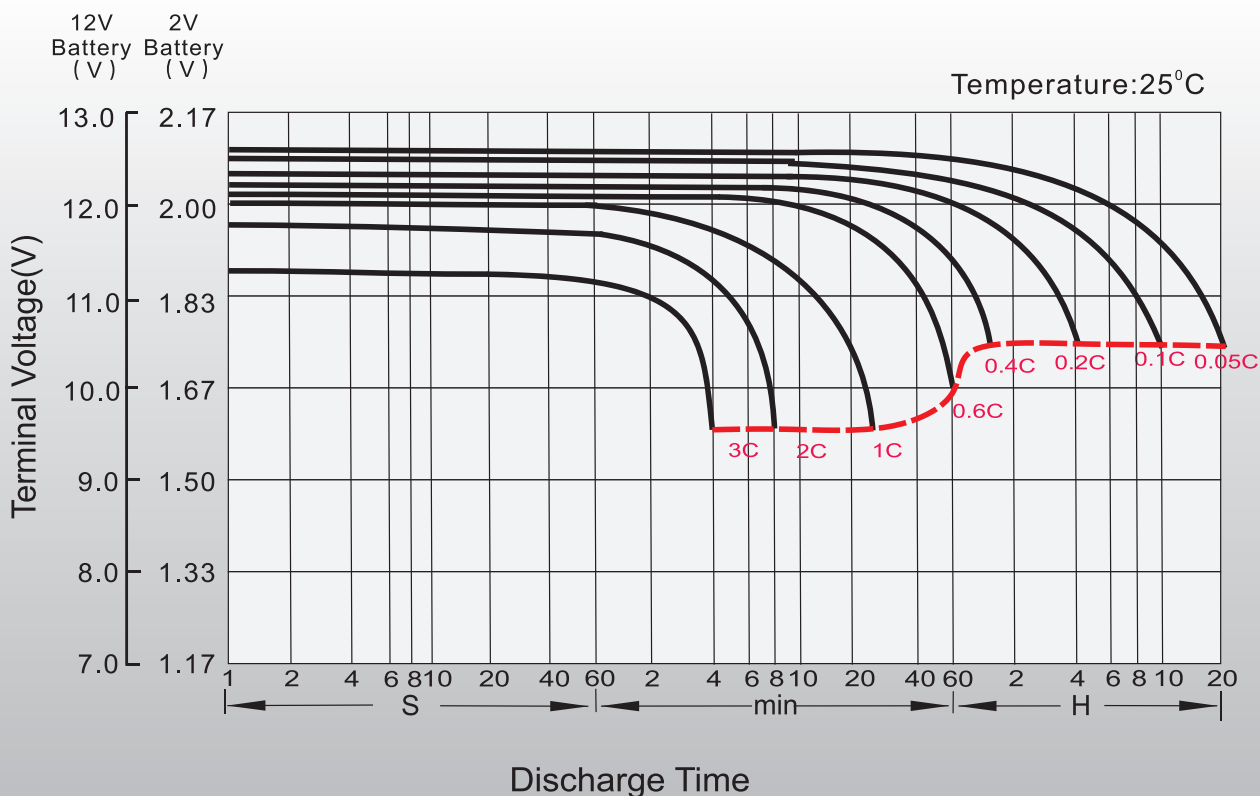
## Constant Current Discharge (Amperes) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	1.5h	2h	3h	4h	5h	8h	10h
1.85V/cell	280.5	232.4	185.5	141.2	101.0	72.4	56.7	40.5	32.3	23.8	19.4	16.5	11.8	9.70
1.80V/cell	315.9	258.7	206.4	159.6	107.2	76.8	60.3	42.8	34.0	24.9	20.2	17.1	12.1	10.0
1.75V/cell	343.4	269.8	215.2	165.7	112.7	80.1	62.9	44.4	35.2	25.8	20.8	17.6	12.2	10.1
1.70V/cell	361.9	273.1	217.9	166.8	117.7	82.7	64.7	45.8	36.3	26.4	21.3	18.0	12.4	10.2
1.67V/cell	375.0	277.3	220.4	173.7	121.7	84.8	66.3	46.8	37.1	26.9	21.6	18.2	12.5	10.3
1.60V/cell	383.6	281.4	228.6	179.1	125.0	86.5	67.7	47.7	37.8	27.6	22.1	18.6	12.6	10.4

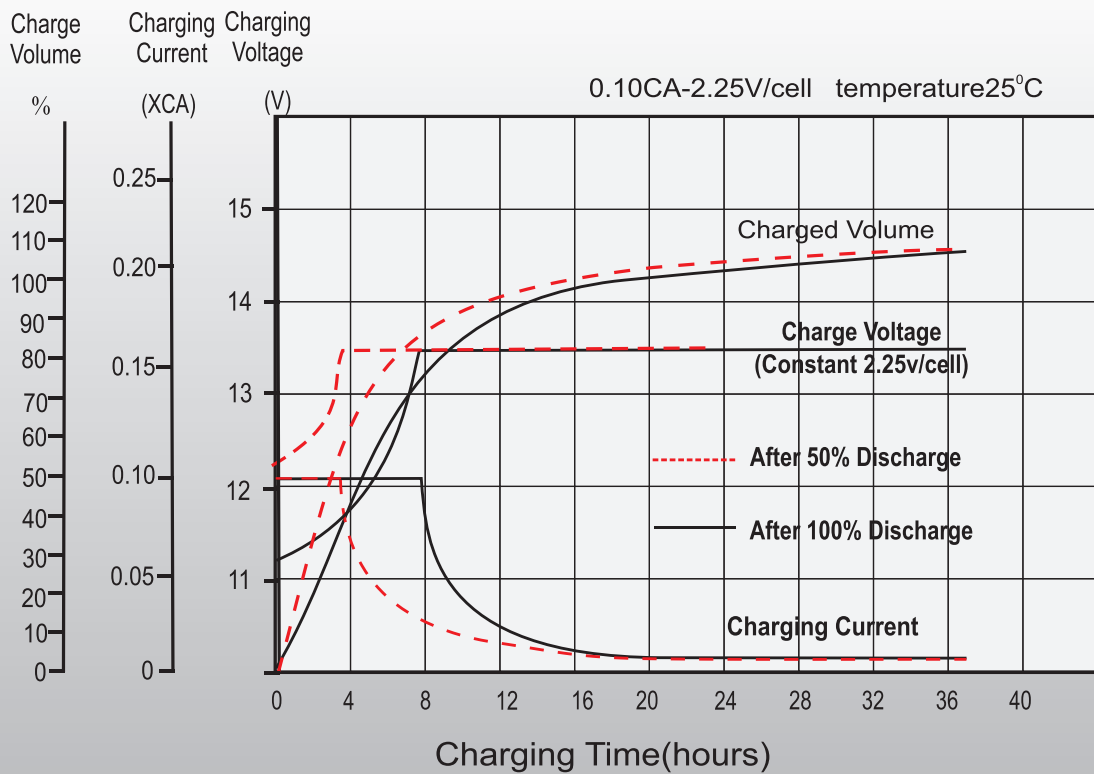
## Constant Power Discharge (Watts/cell) at 25°C (77°F)

F.V/Time	5min	10min	15min	20min	30min	45min	1h	1.5h	2h	3h	4h	5h	8h	10h
1.85V/cell	506.7	420.6	334.5	273.8	198.9	143.8	113.4	81.1	64.9	48.0	39.5	33.7	24.0	20.0
1.80V/cell	572.6	468.7	372.8	305.1	209.9	151.8	120.1	85.5	68.1	50.1	41.0	35.0	24.5	20.5
1.75V/cell	617.2	489.1	389.1	318.4	219.2	157.7	124.8	88.4	70.3	51.8	42.4	36.0	24.9	20.6
1.70V/cell	655.9	495.2	393.9	322.4	227.1	161.9	127.6	90.6	72.1	53.1	43.3	36.6	25.1	20.8
1.67V/cell	680.0	502.8	400.0	327.3	232.6	165.0	129.8	92.8	73.4	54.5	44.1	37.0	25.4	20.9
1.60V/cell	689.7	510.5	408.3	332.3	236.0	168.5	131.5	94.6	74.7	55.0	44.6	37.6	25.6	21.2

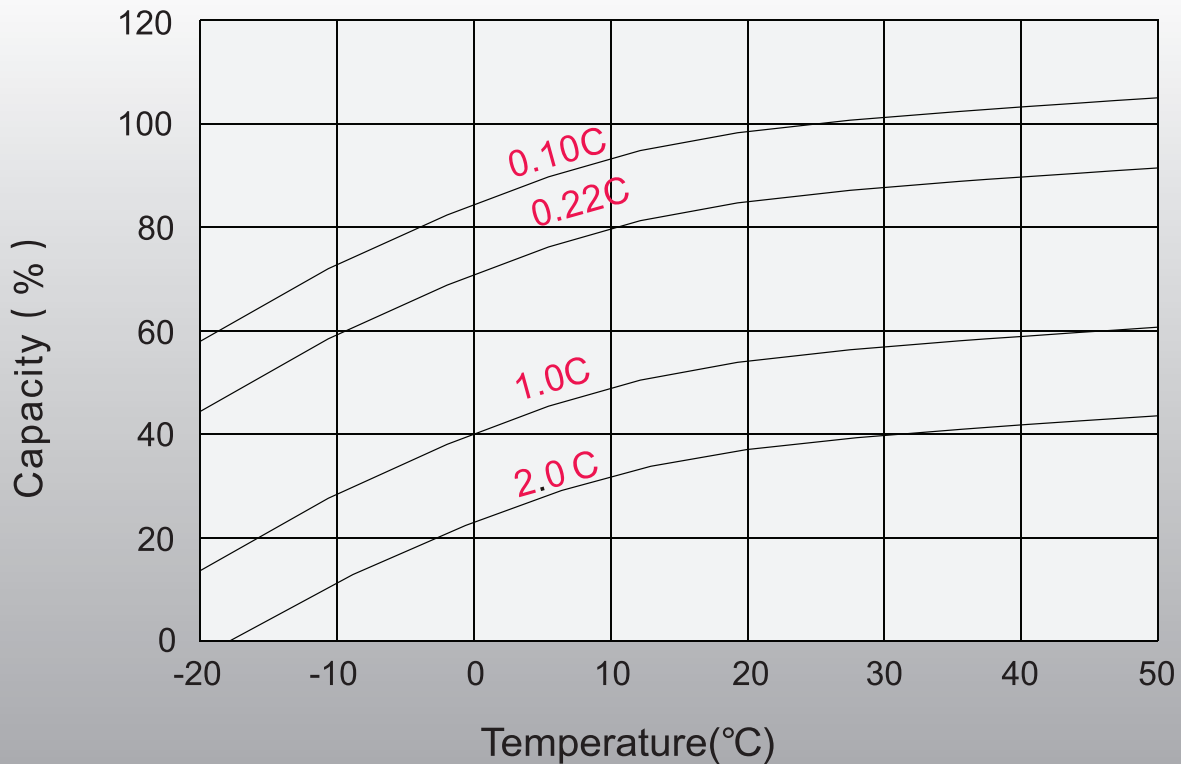
## Discharge Characteristics



# Float Charging Characteristics

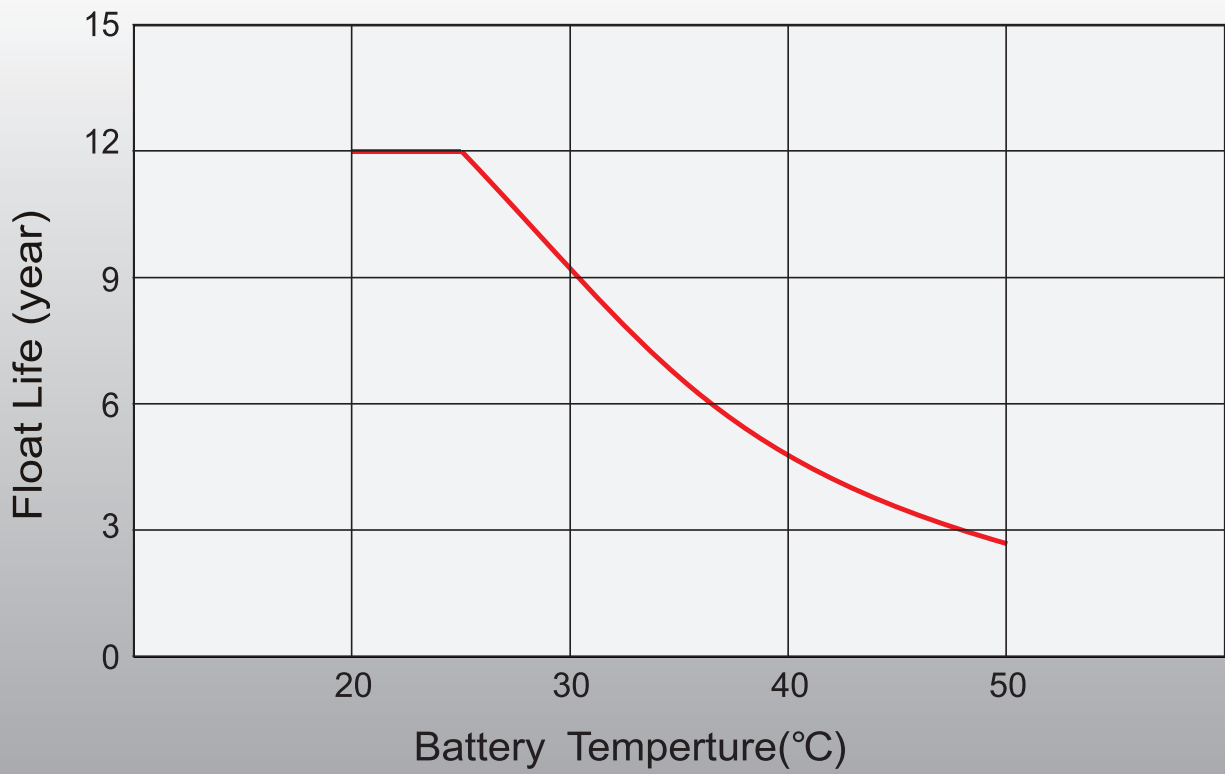


# Temperature Effects in Relation to Battery Capacity





# Effect of Temperature on Long Time Float Life





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