



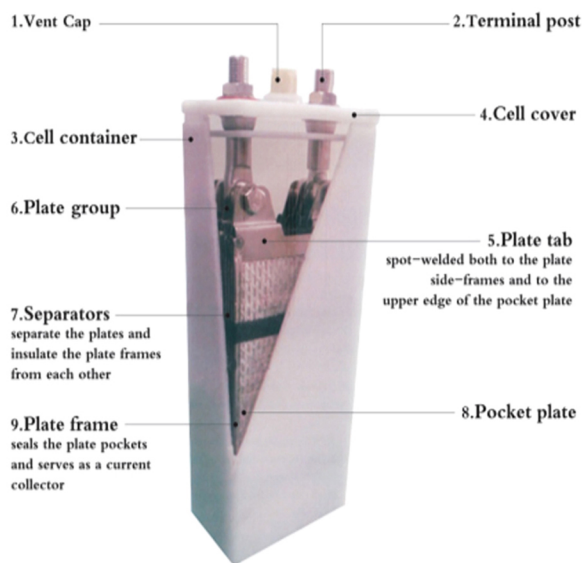
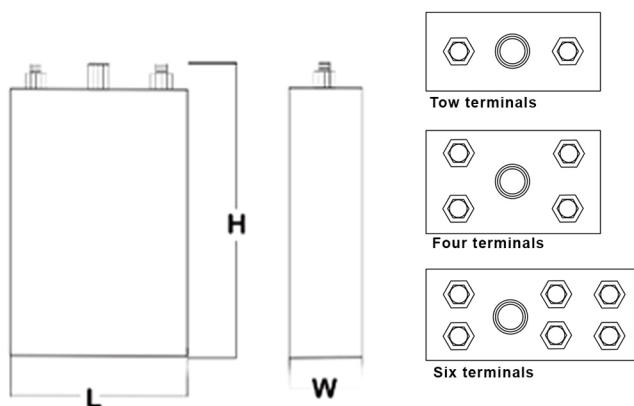
باتری های سری PEN شرکت مهندسی و ساخت پرداس انرژی از نوع باتری های نیکل کادمیوم (Ni-Cd) در سه گروه دشارژ آهسته (PENL)، دشارژ متوسط (PENM) و دشارژ سریع (PENH) با بالاترین سطح کیفی و کمترین نیاز به سرویس و نگهداری تولید می گردد.

این گروه از باتری های نیکل کادمیوم با بازدهی و ضریب اطمینان بالا، محدوده وسیع دمای کارکرد، ضریب حداقل خود دشارژی، مقاوم در برابر شارژ و دشارژ اضافی و ساختار فیزیکی مستحکم، مناسب برای استفاده در انواع روش های ذخیره سازی و تامین انرژی به صورت DC است.

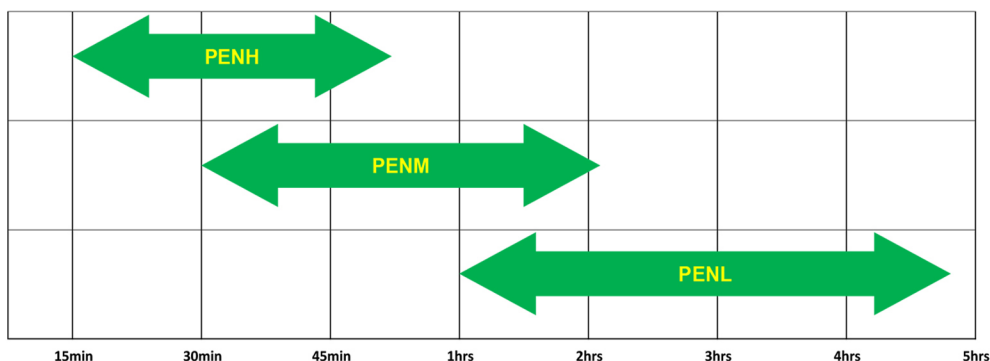
کاربرد این باتری ها در برخی از صنایع عبارتند از:

ذخیره انرژی های تجدید پذیر، مخابرات، معادن، ناوبری هوایی، حمل و نقل ریلی (راه آهن)، نفت و گاز، حفاری، پتروشیمی، خطوط انتقال و توزیع، حمل و نقل ریلی شهری، دیزل ژنراتور، نیروگاهی و خدمات رفاهی است.

این باتری ها متناسب با استاندارد های روز دنیا و کنترل مداوم قطعات اولیه و محصولات تولیدی مطابق با استاندارد HSE - MS و ISO9001: 2015 بوده لذا دارای طول عمر بالا در دو گروه آمپر ساعت، اورپایی و آسیایی به صورت سفارشی تولید میگردد که تطبیق پذیری مناسبی با انواع دستگاه های UPS و Rectifier را دارد.



### Ecommended Type Selection



<b>Recommended Charging Voltage</b>		
<b>MedCell Type</b>	<b>Floating charge voltages(V/pc)</b>	<b>Equalizing charge voltage(v/pc)</b>
PENL	1.44-1.50	1.65-1.70
PENM	1.42-1.45	1.60-1.65
PENH	1.40-1.43	1.60-1.65

<b>Cell capacity and dimension low type</b>									
<b>PENL LOW RATE TYPE</b>									
cell type	Nominal Voltage	Rated Capacity	Dimension(mm)			weight (filled)(Kg)	Electrolyte Volume(L)	Pole	Container Material
			L	W	H				
PENL10-(2)	1.2	10	85	39	126	0.66	0.12	M5	ABS
PENL20	1.2	20	144	53	246	1.80	0.72	M5	ABS
PENL40	1.2	40	144	53	246	2.70	0.60	M10*1	ABS
PENL50	1.2	50	142	67	229	3.20	0.70	M10*1	ABS
PENL100-(2)	1.2	100	139	79	362	6.50	1.70	M16	ABS
PENL100-(4)	1.2	100	140	79	378	7.00	1.90	M10*1	ABS
PENL100-(5)	1.2	100	139	79	362	6.50	1.70	M10*1	ABS
PENL150	1.2	150	167	162	343	13.00	3.30	M20*1.5	ABS
PENL200	1.2	200	167	162	343	14.00	3.30	M20*1.5	ABS
PENL250-(2)	1.2	250	174	161	557	17.00	4.00	M20*1.5	ABS
PENL300-(2)	1.2	300	176	161	540	22.80	4.00	M20*1.5	ABS
PENL350-(2)	1.2	350	176	161	535	23.00	4.00	M20*1.5	ABS
PENL400-(2)	1.2	400	176	161	535	25.00	4.20	M20*1.5	ABS
PENL400-(3)	1.2	400	232	172	410	24.50	6.00	M16	ABS
PENL500-(3)	1.2	500	290	172	505	39.00	5.00	M20*1.5	ABS
PENL600-(2)	1.2	600	291	174	506	50.00	6.00	M20*1.5	ABS
PENL800-(2)	1.2	800	398	184	562	63.00	18.00	M20*1.5	ABS
PENL1000-(2)	1.2	1000	398	184	560	73.00	18.00	M20*1.5	ABS
PENL1100-(2)	1.2	1100	398	184	560	74.50	19.00	M20*1.5	ABS
PENL400-(2)	1.2	1200	398	184	560	75.00	19.50	M20*1.5	ABS

2PENL10-(2)	2.4	10	85	78	126	1.34	0.24	M5	ABS
2PENL10-(2)A	2.4	10	170	38	126	1.34	0.24	M5	ABS
4PENL10-(2)	4.8	10	160	91	135	3.12	0.48	M5	ABS
5PENL10-(2)	6	10	197	91	135	3.81	0.6	M5	ABS
6PENL10-(2)	7.2	10	235	91	135	4.52	0.72	M5	ABS
5PENL50A	6	50	375	153	259	18.1	3.5	M10x1	ABS
5PENL50B	6	50	375	153	259	18.1	3.5	M10x1	ABS
5PENL100-(2)	6	100	391	152	392	35	8.5	M16	ABS
3PENL200	3.6	200	563	209	362	63	10	M20 x 1.5	ABS





Cell capacity and dimension medium type									
PENM Medium RATE TYPE									
cell type	Nominal Voltage	Rated Capacity	Dimension(mm)			weight (filled)(Kg)	Electolyte Volume(L)	Pole	Container Material
			L	W	H				
PENM20	1.2	20	142	66	227	3.50	1.10	M10x1	ABS
PENM30	1.2	30	142	66	227	3.50	1.00	M10x1	ABS
PENM40	1.2	40	139	79	291	5.00	1.50	M16	ABS
PENM50	1.2	50	139	79	291	5.00	1.30	M16	ABS
PENM60	1.2	60	139	79	291	5.00	1.20	M16	ABS
PENM60-(2)	1.2	60	138	78	290	5.50	1.30	M16	ABS
PENM75	1.2	75	139	79	361	6.50	1.67	M16	ABS
PENM85	1.2	85	165	105	350	9.30	2.00	M20 x 1.5	ABS
PENM100	1.2	100	165	105	350	9.30	1.75	M20 x 1.5	ABS
PENM100-(3)	1.2	100	140	79	362	7.00	1.70	M16	ABS
PENM120	1.2	120	167	162	343	12.60	2.92	M20 x 1.5	ABS
PENM150-(2)	1.2	150	167	162	343	13.50	3.08	M20 x 1.5	ABS
PENM200	1.2	200	284	172	348	24.50	5.83	M20 x 1.5	ABS
PENM200-(4)	1.2	200	284	172	348	24.50	5.83	M20 x 1.5	ABS
PENM250	1.2	250	284	172	348	26.00	5.83	M20 x 1.5	ABS
PENM300-(2)	1.2	300	176	161	540	23.00	4.17	M20 x 1.5	ABS
PENM300-(3)	1.2	300	232	172	425	25.00	6.00	M16	ABS
PENM400	1.2	400	291	174	501	36.00	8.10	M20 x 1.5	ABS
PENM500	1.2	500	291	174	501	39	7.5	M20 x 1.5	ABS
PENM600	1.2	600	397	183	564	44.00	17.00	M20x1.5	ABS
PENM700	1.2	700	397	183	564	49.00	16.00	M20 x 1.5	ABS
PENM800 (2)	1.2	BOO	397	183	564	66.00	15.00	M20 x 1.5	ABS
PENM1000-(2)	1.2	1000	398	184	572	76.00	15.00	M20 x 1.5	ABS

Cell capacity and dimension high type									
PENH HIGH RATE TYPE									
cell type	Nominal Voltage	Rated Capacity	Dimension(mm)			weight (filled)(Kg)	Electolyte Volume(L)	Pole	Container Material
			L	W	H				
PENH20	1.2	20	139	79	291	5.00	1.50	M16	ABS
PENH30	1.2	30	139	79	291	5.00	1.40	M16	ABS
PENH40	1.2	40	139	79	361	6.50	1.72	M16	ABS
PENH50	1.2	50	139	79	361	6.50	1.70	M16	ABS
PENH60	1.2	60	165	105	350	9.30	1.85	M20x1.5	ABS
PENH70	1.2	70	165	105	350	9.30	1.80	M20 x 1.5	ABS
PENH80	1.2	80	165	105	350	9.30	1.75	M20x1.5	ABS
PENH100	1.2	100	167	162	343	13.50	3.10	M20x1.5	ABS
PENH120	1.2	120	167	162	343	13.50	3.08	M20 x 1.5	ABS
PENH150	1.2	150	284	172	346	24.50	5.83	M20 x 1.5	ABS
PENH200	1.2	200	291	174	501	39.00	8.50	M20x1.5	ABS
PENH250	1.2	250	291	174	501	39.00	8.00	M20x1.5	ABS
PENH300	1.2	300	291	174	501	39.00	7.50	M20 x 1.5	ABS
PENH400	1.2	400	397	183	564	66.00	16.00	M20x1.5	ABS
PENH500	1.2	500	397	183	564	66.00	15.00	M20 x 1.5	ABS
PENH600	1.2	600	520	186	570	71.00	19.00	M20 x 1.5	ABS
PENH700	1.2	700	520	186	570	78	18.5	M20x1.5	ABS
PENH800	1.2	800	520	186	570	82.00	18.00	M20 x 1.5	ABS



<b>Low type cell performance</b>												
<b>Discharge current and time when battery is fully charge at 20°C±5°C</b>												
<b>End voltage of 1.0V/Cell</b>												
<b>Cell Type</b>	<b>Rated Capacity (Ah)</b>	<b>hour</b>					<b>minute</b>					
		<b>8</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
PENL10	10	1.26	2	3.1	4.2	6.5	8	8.5	9	10	11	12.2
PENL20	20	2.52	4	6.2	8.4	13	16	17	18	20	22	24.4
PENL50	50	6.25	9.7	14	20	30	33	35	40	42.5	50	60
PENL40	40	5.04	8	12.4	16.8	26	32	34	36	40	44	48.8
PENL100	100	12.6	20	31	42	65	80	85	90	100	110	122
PENL150	150	18.9	30	46.5	63	97.5	120	127.5	135	150	165	183
PENL200	200	25.2	40	62	84	130	160	170	180	200	220	244
PENL250	250	31.5	50	77.5	105	162.5	200	212.5	225	250	275	305
PENL300	300	37.8	60	93	126	195	240	255	270	300	330	366
PENL350	350	44.1	70	109	147	227.5	280	297.5	315	350	385	427
PENL400	400	50.4	80	124	168	260	320	340	360	400	440	488
PENL500	500	63	100	155	210	325	400	425	450	500	550	610
PENL600	600	75.6	120	186	252	390	480	510	540	600	660	732
PENL800	800	100.8	160	248	336	520	640	680	720	800	880	976
PENL1000	1000	126	200	310	420	650	800	850	900	1000	1100	1220
PENL1100	1100	138.6	220	341	462	715	880	935	990	1100	1210	1342
PENL1200	1200	151.2	240	372	504	780	960	1020	1080	1200	1320	1464

<b>Low type cell performance</b>												
<b>Discharge current and time when battery is fully charge at 20°C±5°C</b>												
<b>End voltage of 1.05V/Cell</b>												
<b>Cell Type</b>	<b>Rated Capacity (Ah)</b>	<b>hour</b>					<b>minute</b>					
		<b>8</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
PENL10	10	1.25	1.9	2.8	4	6	6.5	7	8	8.5	10	12
PENL20	20	2.5	3.9	5.6	8	12	13	14	16	17	20	24
PENL40	40	5	7.8	11	16	24	26	28	32	34	40	48
PENL50	50	6.25	9.7	14	20	30	32.5	35	40	42.5	50	60
PENL100	100	12.5	19.4	28	40	60	65	70	80	85	100	120
PENL150	150	18.8	29.1	42	60	90	97.5	105	120	128	150	180
PENL200	200	25	38.8	56	80	120	130	140	160	170	200	240
PENL250	250	31.3	48.5	70	100	150	163	175	200	213	250	300
PENL300	300	37.5	58.2	84	120	180	195	210	240	255	300	360
PENL350	350	43.8	67.9	98	140	210	228	245	280	298	350	420
PENL400	400	50	77.6	112	160	240	260	280	320	340	400	480
PENL500	500	62.5	97	140	200	300	325	350	400	425	500	600
PENL600	600	75	116	168	240	360	390	420	480	510	600	720
PENL800	800	100	155	224	320	480	520	560	640	680	800	960
PENL1000	1000	125	194	280	400	600	650	700	800	850	1000	1200
PENL1100	1100	138	213	308	440	660	715	770	880	935	1100	1320
PENL1200	1200	150	233	336	480	720	780	840	960	1020	1200	1440



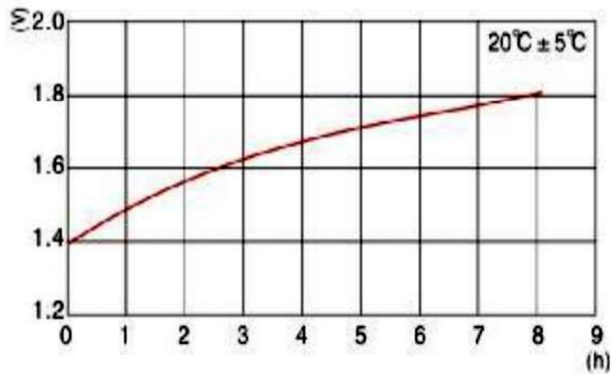


<b>Low type cell performance</b>												
<b>Discharge current and time when battery is fully charge at 20°C±5°C</b>												
<b>End voltage of 1.10V/Cell</b>												
<b>Cell Type</b>	<b>Rated Capacity (Ah)</b>	<b>hour</b>					<b>minute</b>					
		<b>8</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
PENL10	10	1.23	1.9	2.7	3.5	4.6	5.5	6	6.5	7	8	10.5
PENL20	20	2.46	3.8	5.4	7	9.2	11	12	13	14	16	21
PENL40	40	5.54	7.6	11	14	18	22	24	26	28	32	42
PENL50	50	6.15	9.5	14	18	23	27.5	30	32.5	35	40	52.5
PENL100	100	12.3	19	27	35	46	55	60	65	70	80	105
PENL150	150	18.5	28.5	41	53	69	82.5	90	97.5	105	120	158
PENL200	200	24.6	38	54	70	92	110	120	130	140	160	210
PENL250	250	30.8	47.5	68	88	115	138	150	163	175	200	263
PENL300	300	36.9	57	81	105	138	165	180	195	210	240	315
PENL350	350	43.1	66.5	95	123	161	193	210	228	245	280	368
PENL400	400	49.2	76	108	140	184	220	240	260	280	320	420
PENL500	500	61.5	95	135	175	230	275	300	325	350	400	525
PENL600	600	73.8	114	162	210	276	330	360	390	420	480	630
PENL800	800	98.4	152	216	280	368	440	480	520	560	640	840
PENL900	900	111	171	243	315	414	495	540	585	630	720	945
PENL1000	1000	123	190	270	350	460	550	600	650	700	800	1050
PENL1100	1100	135	209	297	385	506	605	660	715	770	880	1155
PENL1200	1200	148	228	324	420	552	660	720	780	840	960	1260

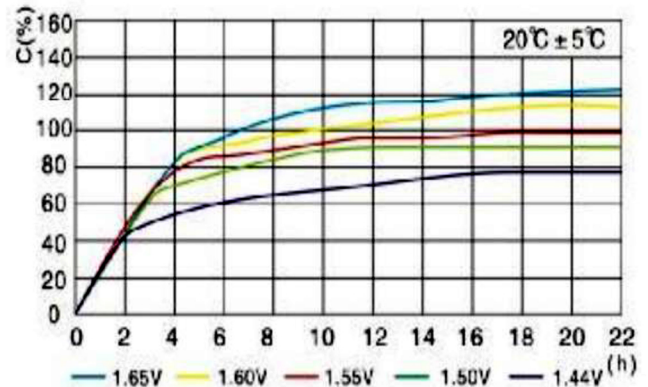
<b>Low type cell performance</b>												
<b>Discharge current and time when battery is fully charge at 20°C±5°C</b>												
<b>End voltage of 1.14V/Cell</b>												
<b>Cell Type</b>	<b>Rated Capacity (Ah)</b>	<b>hour</b>					<b>minute</b>					
		<b>8</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>30</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>	<b>1</b>
PENL10	10	118	1.8	2.5	2.8	3.8	4.5	5	5.5	6	6.5	8.5
PENL20	20	2.36	3.6	5	5.6	7.6	9	10	11	12	13	17
PENL40	40	4.72	7.2	10	11	15	18	20	22	24	26	34
PENL45	45	5.31	8.1	11	13	17	20.3	23	24.8	27	29.3	38.3
PENL50	50	5.9	9	13	14	19	22.5	25	27.5	30	32.5	42.5
PENL100	100	11.8	18	25	28	38	45	50	55	60	65	85
PENL150	150	17.7	27	38	42	57	67.5	75	82.5	90	97.5	128
PENL200	200	23.6	36	50	56	76	90	100	110	120	130	170
PENL250	250	29.5	45	63	70	95	113	125	138	150	163	213
PENL300	300	35.4	54	75	84	114	135	150	165	180	195	255
PENL350	350	41.3	63	88	98	133	158	175	193	210	228	298
PENL400	400	47.2	72	100	112	152	180	200	220	240	260	340
PENL500	500	59	90	125	140	190	225	250	275	300	325	425
PENL600	600	70.8	108	150	168	228	270	300	330	360	390	510
PENL800	800	94.4	144	200	224	304	360	400	440	480	520	680
PENL900	900	106	162	225	252	342	405	450	495	540	585	765
PENL1000	1000	118	180	250	280	380	450	500	550	600	650	850
PENL1100	1100	130	198	275	308	418	495	550	605	660	715	935
PENL1200	1200	142	216	300	336	456	540	600	660	720	780	1020



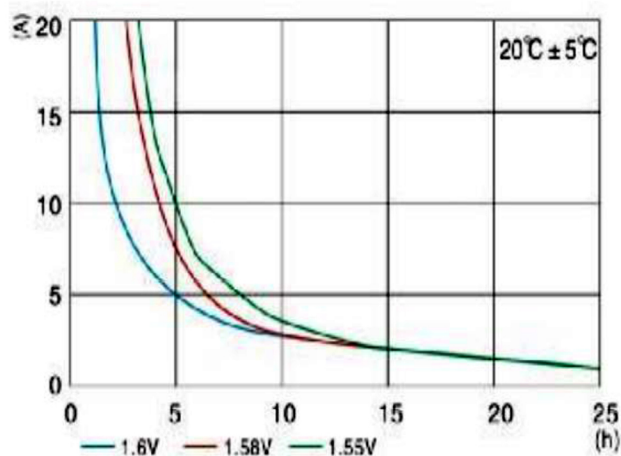
0.21A charge curves of Ni-cd low rate battery



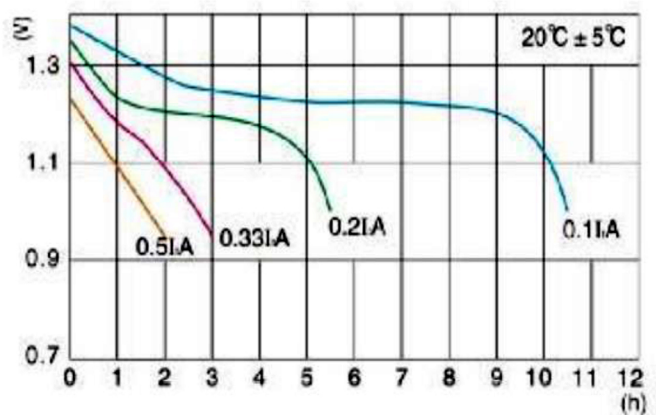
Ni-cd low rate charge curves related to different constant voltage



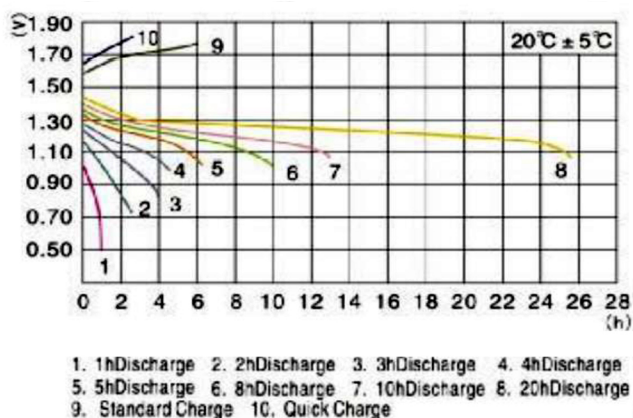
Constant voltage charge A-h curves of Ni-cd low rate battery



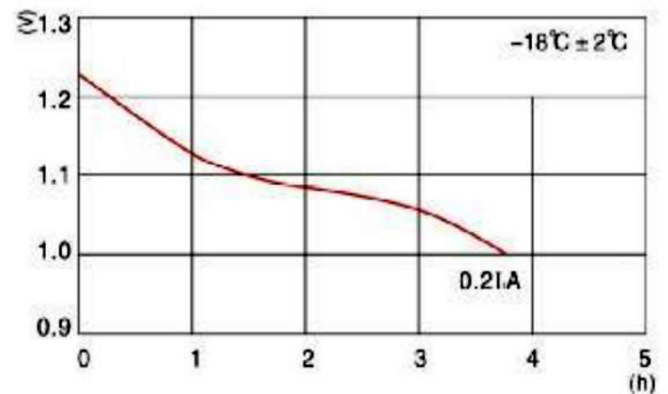
Discharge curves of Ni-cd low rate battery



Charge and discharge curves of Ni-cd battery



0.21A discharge curves of Ni-cd low rate battery



Medium type cell performance															
Discharge current and time when battery is fully charge at 20°C±5°C															
End voltage of 1.0V/Cell															
Cell Type	Rated Capacity (Ah)	hour					minute						second		
		8	5	3	2	1	30	20	15	10	5	1	30	5	1
PENM20	20	2.52	4	6.4	9.2	15	22	25	27	31.2	36	48	52	68	70
PENM30	30	3.78	6	9.6	13.8	22.5	33	37.5	40.5	46.8	54	72	78	102	105
PENM40	40	5.04	8	12.8	18.4	30	44	50	54	62.4	72	96	104	136	140
PENM50	50	6.3	10	16	23	37.5	55	62.5	67.5	78	90	120	130	170	175
PENM60	60	7.66	12	19.2	27.6	45	66	75	81	93.6	108	144	156	204	210
PENM75	75	9.45	15	24	34.5	56.3	82.5	93.8	101.3	117	135	180	195	255	262.5
PENM85	85	10.08	16	25.6	36.8	60	88	100	108	124.8	144	192	208	272	280
PENM100	100	12.6	20	32	46	75	110	125	135	156	180	240	260	340	350
PENM120	120	15.12	24	38.4	55.2	90	132	150	162	187.2	216	288	312	408	420
PENM150	150	18.9	30	48	69	112.5	165	187.5	202.5	234	270	360	390	510	525
PENM200	200	25.2	40	64	92	150	220	250	270	312	360	480	520	680	700
PENM250	250	31.5	50	80	115	187.5	275	312.5	337.5	390	450	600	650	850	875
PENM300	300	37.8	60	96	138	225	330	375	405	468	540	720	780	1020	1050
PENM400	400	50.4	80	128	184	300	440	500	624	540	720	960	1040	1360	1400
PENM500	500	63	100	160	230	375	550	625	675	780	900	1200	1300	1700	1750
PENM600	600	75.6	120	192	276	450	660	750	810	936	1080	1440	1560	2040	2100
PENM700	700	88.2	140	224	322	525	770	875	945	1092	1260	1680	1820	2380	2450
PENM800	800	100.8	160	256	368	600	880	1000	1080	1248	1440	1920	2080	2720	2800
PENM1000	1000	126	200	320	460	750	1100	1250	1350	1560	1800	2400	2600	3400	3500

Medium type cell performance															
Discharge current and time when battery is fully charge at 20°C±5°C															
End voltage of 1.05V/Cell															
Cell Type	Rated Capacity (Ah)	hour					minute						second		
		8	5	3	2	1	30	20	15	10	5	1	30	5	1
PENM20	20	2.48	3.92	6.2	8.4	14	18	23	24	26.4	32	40	44	50	60
PENM30	30	3.72	5.88	9.3	12.6	21	27	34.5	36	39.6	48	60	66	75	90
PENM40	40	4.96	7.84	12.4	16.8	28	36	46	48	52.8	64	80	88	100	120
PENM50	50	6.2	9.8	15.5	21	35	45	57.5	60	66	80	100	110	125	150
PENM60	60	7.44	11.76	19.6	25.2	42	54	69	72	79.2	96	120	132	150	180
PENM75	75	9.3	14.7	23.25	31.5	52.5	67.5	86.3	90	99	120	150	165	187.5	225
PENM85	85	9.92	15.68	24.8	33.6	56	72	92	96	105.6	128	160	176	200	240
PENM100	100	12.4	19.6	31	42	70	90	115	120	132	160	200	220	250	300
PENM120	120	14.88	23.52	37.2	50.4	84	108	138	144	158.4	192	240	264	300	360
PENM150	150	18.6	29.4	46.5	63	105	135	172.5	180	198	240	300	330	375	450
PENM200	200	24.8	39.2	62	84	140	180	230	240	264	320	400	440	500	600
PENM250	250	31	49	77.5	105	175	225	287.5	300	330	400	500	550	625	750
PENM300	300	37.2	58.8	93	126	210	270	345	360	396	480	600	660	750	900
PENM400	400	49.6	78.4	124	168	280	360	460	480	528	640	800	880	1000	1200
PENM500	500	62	98	155	210	350	450	575	600	660	800	1000	1100	1250	1500
PENM600	600	74.4	117.6	186	252	420	540	690	720	792	960	1200	1320	1500	1800
PENM700	700	86.8	137.2	217	294	490	630	805	840	924	1120	1400	1540	1750	2100
PENM800	800	99.2	156.8	248	336	560	720	920	960	1056	1280	1600	1760	2000	2400
PENM1000	1000	124	196	310	420	700	900	1150	1200	1320	1600	2000	2200	2500	3000

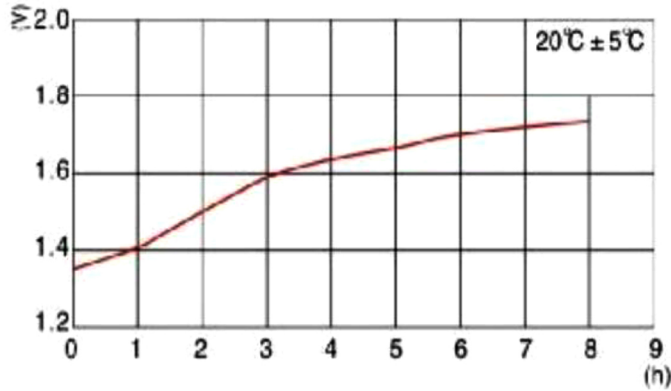


Medium type cell performance															
Discharge current and time when battery is fully charge at 20°C±5°C															
End voltage of 1.1V/Cell															
Cell Type	Rated Capacity (Ah)	hour					minute					second			
		8	5	3	2	1	30	20	15	10	5	1	30	5	1
PENM20	20	2.44	3.88	6	7.6	12	16	18	20	22	26	36	38	44	52
PENM30	30	3.66	5.82	9	11.4	18	24	27	30	33	39	54	57	66	78
PENM40	40	4.88	7.76	12	15.2	24	32	36	40	44	52	72	76	88	104
PENM50	50	6.1	9.7	15	19	30	40	45	50	55	65	90	95	110	130
PENM60	60	7.32	11.6	18	22.8	36	48	54	60	66	78	108	114	132	156
PENM75	75	9.15	14.6	22.5	28.5	45	60	67.5	75	82.5	97.5	135	142.5	165	195
PENM85	85	9.76	15.5	24	30.4	48	64	72	80	88	104	144	152	176	208
PENM100	100	12.2	19.4	30	38	60	80	90	100	110	130	180	190	220	260
PENM120	120	14.6	23.3	36	45.6	72	96	108	120	132	156	216	228	264	312
PENM150	150	18.3	29.1	45	57	90	120	135	150	165	195	270	285	330	390
PENM200	200	24.4	38.8	60	76	120	160	180	200	220	260	360	380	440	520
PENM250	250	30.5	48.5	75	95	150	200	225	250	275	325	450	475	550	650
PENM300	300	36.6	58.2	90	114	180	240	270	300	330	390	540	570	660	780
PENM400	400	48.8	77.6	120	152	240	320	360	400	440	520	720	760	880	1040
PENM500	500	61	97	150	190	300	400	450	500	550	650	900	950	1100	1300
PENM600	600	73.2	116	180	228	360	480	540	600	660	780	1080	1140	1320	1560
PENM700	700	85.4	136	210	266	420	560	630	700	770	910	1260	1330	1540	1820
PENM800	800	97.6	155	240	304	480	640	720	800	880	1040	1440	1520	1760	2080
PENM1000	1000	122	194	300	380	600	800	900	1000	1100	1300	1800	1900	2200	2600

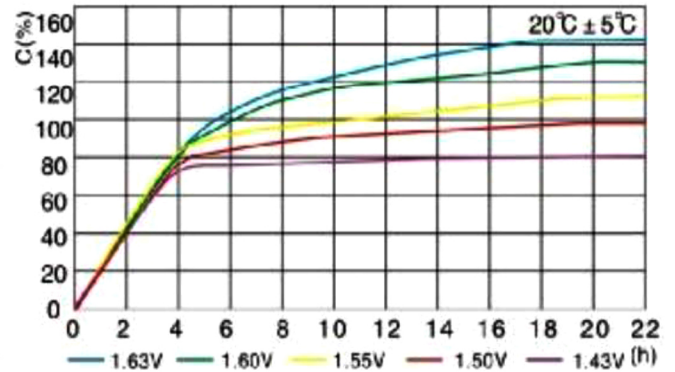
Medium type cell performance															
Discharge current and time when battery is fully charge at 20°C±5°C															
End voltage of 1.14V/Cell															
Cell Type	Rated Capacity (Ah)	hour					minute					second			
		8	5	3	2	1	30	20	15	10	5	1	30	5	1
PENM20	20	3.36	3.6	5.4	6.6	6	11	13	14	16	19	26	32	36	38
PENM30	30	3.54	5.4	8.1	9.9	14	17	20	21	24	29	39	48	54	57
PENM40	40	4.72	7.2	11	13	18	22	26	28	32	38	52	64	72	76
PENM50	50	5.9	9	14	17	23	28	33	35	40	48	65	80	90	95
PENM60	60	7.08	10.8	16	20	27	33	39	42	48	57	78	96	108	114
PENM75	75	8.85	13.5	20	25	34	41	49	53	60	71	97.5	120	135	143
PENM85	85	9.44	14.4	22	26	36	44	52	56	64	76	104	128	144	152
PENM100	100	11.8	18	27	33	45	55	65	70	80	95	130	160	180	190
PENM120	120	14.2	21.6	32	40	54	66	78	84	96	114	156	192	216	228
PENM150	150	17.7	27	41	50	68	83	98	105	120	143	195	240	270	285
PENM200	200	23.6	36	54	66	90	110	130	140	160	190	260	320	360	380
PENM250	250	29.5	45	68	83	113	138	163	175	200	238	325	400	450	475
PENM300	300	35.4	54	81	99	135	165	195	210	240	285	390	480	540	570
PENM400	400	47.2	72	108	132	180	220	260	280	320	380	520	640	720	760
PENM500	500	59	90	135	165	225	275	325	350	400	475	650	800	900	950
PENM600	600	70.8	108	162	198	270	330	390	420	480	570	780	960	1080	1140
PENM700	700	82.6	126	189	231	315	385	455	490	560	665	910	1120	1260	1330
PENM800	800	94.4	144	216	264	360	440	520	560	640	760	1040	1280	1440	1520
PENM1000	1000	118	180	270	330	450	550	650	700	800	950	1300	1600	1800	1900



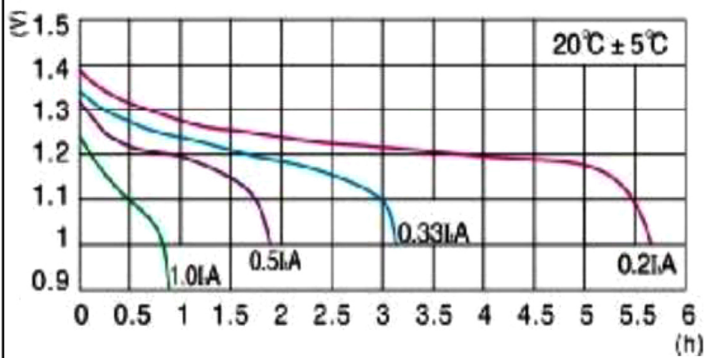
0.2ItA charge curves of Ni-cd medium rate battery



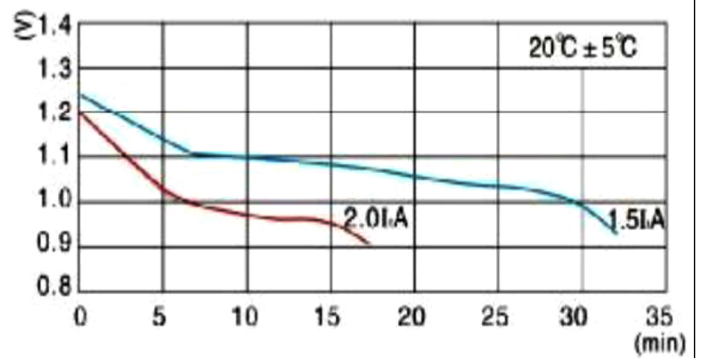
Different constant voltage charge curves of medium rate Ni-cd battery at normal temperature



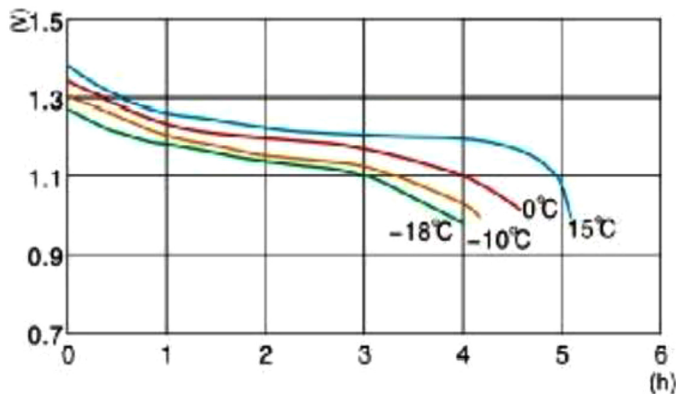
Discharge curves of medium rate Ni-cd medium rate battery



Discharge curves of Ni-cd medium rate battery



Discharge curves of Ni-cd medium rate battery at different discharge rates



Ni-cd medium rate battery output capacity related to different temperature



High type cell performance																
Discharge current and time when battery is fully charge at 20°C±5°C																
End voltage of 1.0V/Cell																
Cell Type	Rated Capacity (Ah)	hour						minute						second		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
PENH20	20	2.52	4	6.6	9.6	12.8	19	25	32	40	46	62	92	104	126	138
PENH30	30	3.78	6	9.9	14.4	19.2	28.5	37.5	48	60	69	93	138	156	189	207
PENH40	40	5.14	8	13.2	19.2	28.5	38	50	64	80	92	124	184	208	252	276
PENH50	50	6.3	10	16.5	24	32	47.5	62.5	80	100	115	155	230	260	315	345
PENH60	60	7.56	12	19.8	28.8	38.4	57	75	96	120	138	186	276	312	378	414
PENH70	70	8.82	14	23.1	33.6	44.8	66.5	87.5	112	140	161	217	322	364	441	483
PENH80	80	10.08	16	26.4	38.4	51.2	76	100	128	160	184	248	368	416	504	552
PENH100	100	12.6	20	33	48	64	95	125	160	200	230	310	460	520	630	690
PENH120	120	15.75	25	41.25	60	80	118.75	156.25	200	250	287.5	387.5	575	650	787.5	862.5
PENH150	150	18.9	30	49.5	72	96	142.5	187.5	240	300	345	465	690	780	945	1035
PENH200	200	25.2	40	66	96	128	190	250	320	400	460	620	920	1040	1260	1380
PENH300	300	37.8	60	99	144	192	285	375	480	600	690	930	1380	1560	1890	2070
PENH400	400	50.4	80	132	192	256	380	500	640	800	920	1240	1840	2080	2520	2760
PENH500	500	63	100	165	240	320	475	625	800	1000	1150	1550	2300	2600	3150	3450
PENH600	600	75.6	120	198	288	384	570	750	960	1200	1380	1860	2760	3120	3780	4140
PENH700	700	88.2	140	231	336	448	665	875	1120	1400	1610	2170	3220	3640	4410	4830
PENH800	800	100.8	160	264	384	512	760	1000	1280	1600	1840	2480	3680	4160	5040	5520

High type cell performance																
Discharge current and time when battery is fully charge at 20°C±5°C																
End voltage of 1.05V/Cell																
Cell Type	Rated Capacity (Ah)	hour						minute						second		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
PENH20	20	2.5	3.92	6.4	9	12.4	17	24	30	35	44	56	70	92	104	108
PENH30	30	3.75	5.88	9.6	13.5	18.6	25.5	36	45	52.5	66	84	105	138	156	162
PENH40	40	5	7.84	12.8	18	24.8	34	48	60	70	88	112	140	184	208	216
PENH50	50	6.25	9.8	16	22.5	31	42.5	60	75	87.5	110	140	175	230	260	270
PENH60	60	7.5	11.8	19.2	27	37.2	51	72	90	105	132	168	210	276	312	324
PENH70	70	8.75	13.7	22.4	31.5	43.4	59.5	84	105	122.5	154	196	245	322	364	378
PENH80	80	10	15.7	25.6	36	49.6	68	96	120	140	176	224	280	368	416	432
PENH100	100	12.5	19.6	32	45	62	85	120	150	175	220	280	350	460	520	540
PENH120	120	15.625	24.5	40	56.25	77.5	106.25	150	187.5	218.75	275	350	437.5	575	650	675
PENH150	150	18.75	29.4	48	67.5	93	127.5	180	225	262.5	330	420	525	690	780	810
PENH200	200	25	39.2	64	90	124	170	240	300	350	440	560	700	920	1040	1080
PENH300	300	37.5	58.8	96	135	180	255	360	450	525	660	840	1050	1380	1560	1620
PENH400	400	50	78.4	128	180	248	340	480	600	700	880	1120	1400	1840	2080	2160
PENH500	500	62.5	98	160	225	316	425	600	750	875	1100	1400	1750	2300	2600	2700
PENH600	600	75	117.6	192	270	384	510	720	900	1050	1320	1680	2100	2760	3120	3240
PENH700	700	87.5	137.2	224	315	452	595	840	1050	1225	1540	1960	2450	3220	3640	3780
PENH800	800	100	156.8	256	360	520	680	960	1200	1400	1760	2240	2800	3680	4160	4320

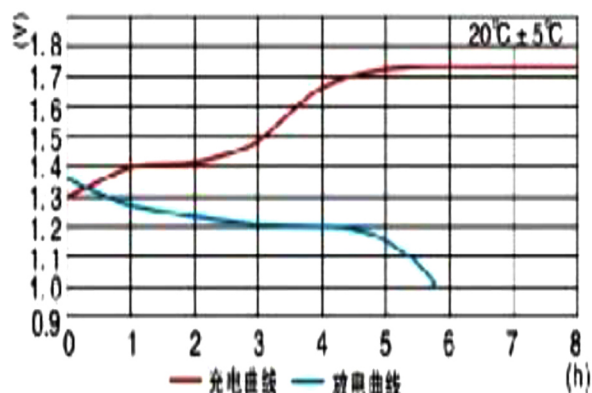


High type cell performance																
Discharge current and time when battery is fully charge at 20°C±5°C																
End voltage of 1.10V/Cell																
Cell Type	Rated Capacity (Ah)	hour						minute						second		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
PENH20	20	2.44	3.88	6.2	8.8	12	15	20	26	32	34	40	64	70	84	90
PENH30	30	3.66	5.82	9.3	13.2	18	22.5	30	39	48	51	60	96	105	126	135
PENH40	40	4.88	7.76	12.4	17.6	24	30	40	52	64	68	80	128	140	168	180
PENH50	50	6.1	9.7	15.5	22	30	37.5	50	65	80	85	100	160	175	210	225
PENH60	60	7.32	11.64	18.6	26.4	36	45	60	78	96	102	120	192	210	252	270
PENH70	70	8.54	13.58	21.7	30.8	42	52.5	70	91	112	119	140	224	245	294	315
PENH80	80	9.76	15.52	24.8	35.2	48	60	80	104	128	136	160	256	280	336	360
PENH100	100	12.2	19.4	31	44	60	75	100	130	160	170	200	320	350	420	450
PENH120	120	15.25	24.25	38.75	55	75	93.75	125	162.5	200	212.5	250	400	437.5	525	563
PENH150	150	18.3	29.1	46.5	66	90	112.5	150	195	240	255	300	480	525	630	676
PENH200	200	24.4	38.8	62	88	120	150	200	260	320	340	400	640	700	840	900
PENH300	300	36.6	58.2	93	132	180	225	300	390	480	510	600	960	1050	1260	1350
PENH400	400	48.8	77.6	124	176	240	300	400	520	640	680	800	1280	1400	1680	1800
PENH500	500	61	97	155	220	300	375	500	650	800	850	1000	1600	1750	2100	2250
PENH600	600	73.2	116.4	186	264	360	450	600	780	960	1020	1200	1920	2100	2520	2700
PENH700	700	85.4	135.8	217	308	420	525	700	910	1120	1190	1400	2240	2450	2940	3150
PENH800	800	97.6	155.2	248	352	480	600	800	1040	1280	1360	1600	2560	2800	3360	3600

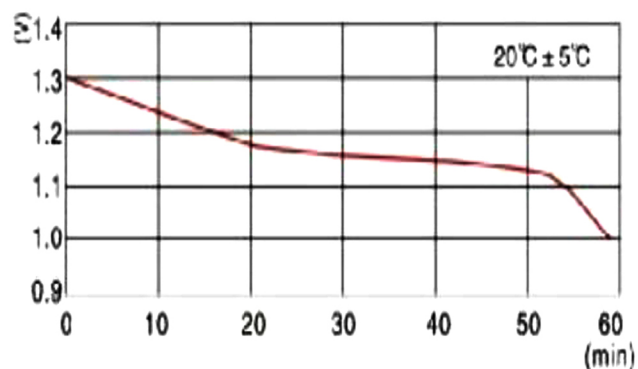
High type cell performance																
Discharge current and time when battery is fully charge at 20°C±5°C																
End voltage of 1.14V/Cell																
Cell Type	Rated Capacity (Ah)	hour						minute						second		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
PENH20	20	2.44	3.88	6.2	8.8	12	15	20	26	32	34	40	64	70	84	90
PENH30	30	3.66	5.82	9.3	13.2	18	22.5	30	39	48	51	60	96	105	126	135
PENH40	40	4.88	7.76	12.4	17.6	24	30	40	52	64	68	80	128	140	168	180
PENH50	50	6.1	9.7	15.5	22	30	37.5	50	65	80	85	100	160	175	210	225
PENH60	60	7.32	11.64	18.6	26.4	36	45	60	78	96	102	120	192	210	252	270
PENH70	70	8.54	13.58	21.7	30.8	42	52.5	70	91	112	119	140	224	245	294	315
PENH80	80	9.76	15.52	24.8	35.2	48	60	80	104	128	136	160	256	280	336	360
PENH100	100	12.2	19.4	31	44	60	75	100	130	160	170	200	320	350	420	450
PENH120	120	15.25	24.25	38.75	55	75	93.75	125	162.5	200	212.5	250	400	437.5	525	563
PENH150	150	18.3	29.1	46.5	66	90	112.5	150	195	240	255	300	480	525	630	676
PENH200	200	24.4	38.8	62	88	120	150	200	260	320	340	400	640	700	840	900
PENH300	300	36.6	58.2	93	132	180	225	300	390	480	510	600	960	1050	1260	1350
PENH400	400	48.8	77.6	124	176	240	300	400	520	640	680	800	1280	1400	1680	1800
PENH500	500	61	97	155	220	300	375	500	650	800	850	1000	1600	1750	2100	2250
PENH600	600	73.2	116.4	186	264	360	450	600	780	960	1020	1200	1920	2100	2520	2700
PENH700	700	85.4	135.8	217	308	420	525	700	910	1120	1190	1400	2240	2450	2940	3150
PENH800	800	97.6	155.2	248	352	480	600	800	1040	1280	1360	1600	2560	2800	3360	3600



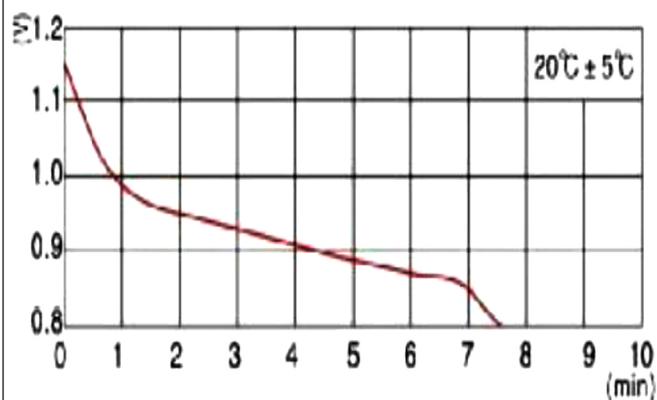
0.21A discharge curves of high discharge rate Ni-cd battery



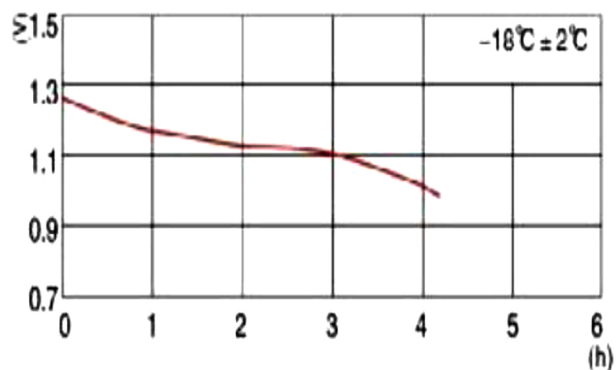
11A discharge curves of high discharge rate Ni-cd battery



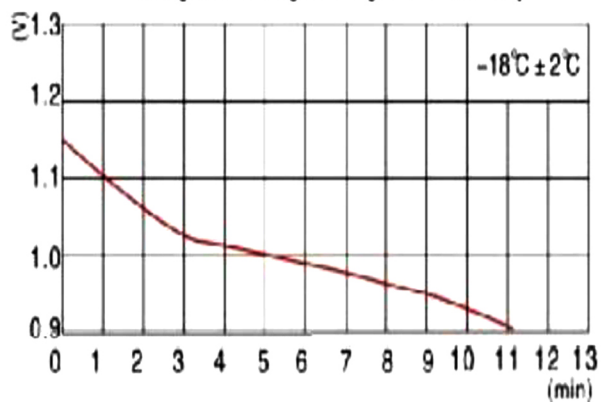
51A discharge curves of high discharge rate Ni-cd battery



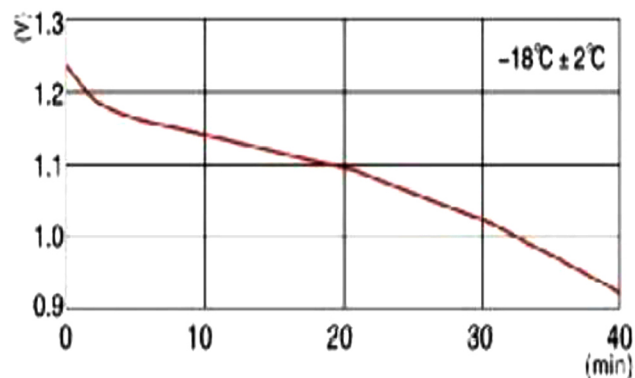
Discharge curves of high discharge rate Ni-cd battery



Discharge curves of high discharge rate Ni-cd battery



11A discharge curves of high discharge rate Ni-cd battery



زمان استاندارد تخلیه برای باتری نیکل کادمیوم ۵ ساعت بوده (C۵) که بایستی از باتری کاملاً شارژ شده (طبق استاندارد IEC ۶۰۶۲۳) تخلیه گرفته شود، تا باتری در دمای ۲۰ درجه سانتی گراد از ولتاژ اسمی ۱.۲ ولت به ازای هر سلول، به ولتاژ پایانی ۱ ولت به ازای هر سلول برسد.

Charge with constant VOLTAGE					
Current limitation 0.3It A					
Stand by			Buffer Operation		
float	1.40-1.42	V/Cell	Average value	1.55-1.70 v/cell	V/Cell
boost	1.55-1.70	V/Cell			V/Cell

Charge with constant CURRENT at 20°C±5°C	
Current limitation 0.3It A	
Standard charge	0.2 It A for 7-8 h
Boos charge	0.3 It A for 2.5h
followed by	0.2 It A for 2.5h
Trickle charge	0.001 - 0.002 A/Ah

