POLARIT Batteries

Nickel-Cadmium (Ni-Cd) Batteries

بک افزار

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www.polaritbattery.com
www.becafzar.com
tech@becafzar.com
info@becafzar.com

Head office :
No.17, sayad shirazi & resalat Cross
Resalat St., Tehran - Iran
Tel : +98 21 22321005 (10 Line)
Fax : +98 21 22321015

Factory :
No.305, main Blvd, Khorramdasht
Industrial Zone, Jajroud,Tehran-Iran
Tel : +98 21 76215148-49
Fax : +98 21 76212590

D&P: Khandehroo-8945521-2

پک افزار

Ni-Cd Batteries

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Nickel Cadmium Alkaline Batteries

Pocket Plate Type
Sintered Plate Type

FEATURES OF POLARIT BATTERIES

- Widely used as DC power for AGV, engine starting, switchgear UPS, signaling, telecommunications, emergency lighting, etc
- Absolute reliability
- Excellent high rate discharge/charge performance
- Long cycle life: more than 1000 cycles at 100% depth of discharge
- High resistance to mechanical and electrical abuse
- Wide operating temperature range: from - 40°C to +60°C
- Low self discharge
- Low internal resistance
- Availability to custom-design and manufacture special models according to user's requirements
- Comply with IEC60623/2001 standard
- Recipient of the approval certificate of IEC60623

POLARIT Batteries

APPLICATIONS OF POLARIT SERIES

KPX TYPE (Ultra High Discharge Rate Cells)

KPX Series ultra high rate nickel cadmium battery, which is made of sintered plates, is characterized as having compact construction, low internal resistance, high reliability, high capacity, long service life, and excellent low temperature performance. The battery is suitable for ultra high discharge rate applications such as AGV, engine starting, switch tripping and closing, etc.

KPH TYPE (High Discharge Rate Cells)

KPH Series high rate nickel cadmium battery is made of pocket plates. It has the characteristics of thin plates, high porosity, and low internal resistance. The battery is particularly suitable for high discharge rate applications such as UPS switchgear tripping and closing, etc.

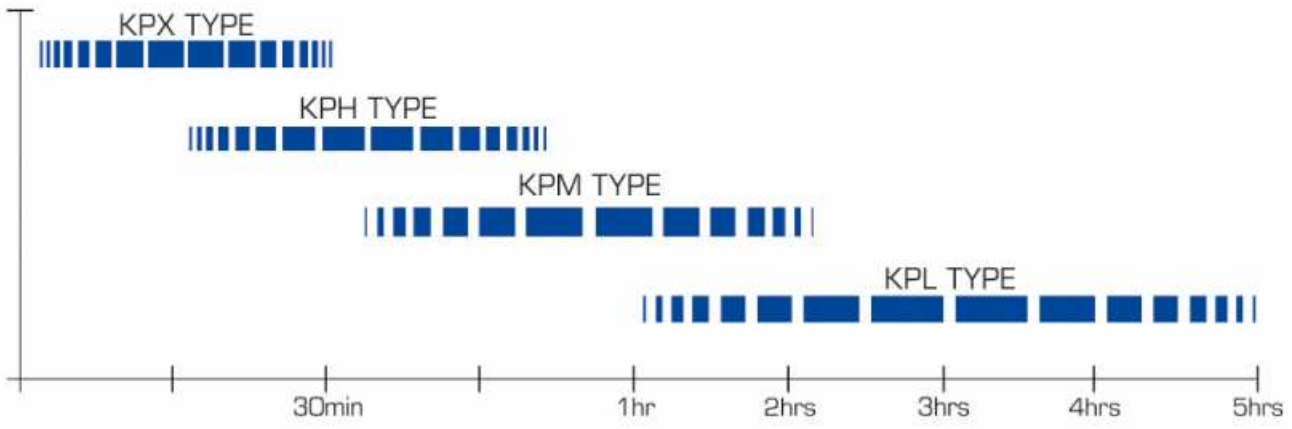
KPM TYPE (Medium Discharge Rate Cells)

KPM Series medium rate nickel cadmium battery is made of pocket plates. The battery is suitable for medium discharge rate applications (between 30 minutes to 5 hours) such as railroad DC power sources,UPS, gas turbine control, etc.

KPL TYPE (Low Discharge Rate Cells)

KPL Series low rate nickel cadmium battery is made of pocket plates.
The battery is designed for general purpose and standby applications such as lighting on trains, operation of circuit breaker, etc.

Recommended Type Selection of **POLARIT** Series.
-According to back up time-



Model	Discharge rate	Plate type	Application
KPX	Ultra High discharge rate	sintered plate	AGV gas turbine generator, engine starting operating/control or computer systems transportation networks. airport. erc.
KPH	High discharge rate	packet plate	engine starting. UPS (up to 30 mins). operation and control of DC motor, water treatment plants, etc.
KPM	Medium discharge rate	packet plate	UPS (over30min), railway DC power sources. auxiliary power source for power stations, Chemical plants. oil refineries. Iron works.
KPL	Low discharge rate	packet plate	emergency lighting, telecommunication operation of communication equipment on a ship lighting and air conditioner control on a train.

CHARGING

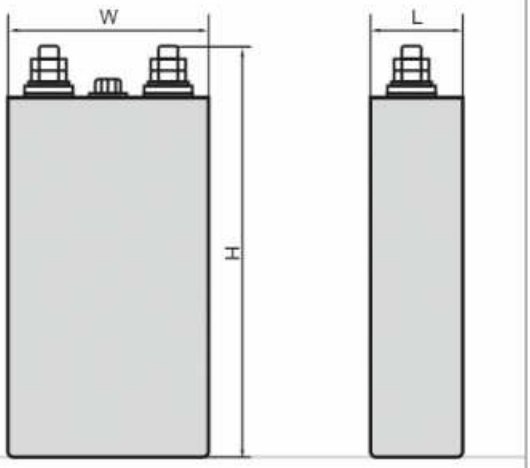
The most common type of charging for stationary batteries is modified constant voltage, usually with current limitation of 0.2C5 A for 8 hr.

The battery is connected to the charger directly which applies a constant voltage across the battery terminals.

Recommended charging voltage

The following single cell charging voltages are recommended:

Cell type	Floating Charge	Equalizing charge
KPX	1.39±0.01	1.47
KPH	1.43±0.01	1.58
KPM	1.44±0.01	1.60
KPL	1.49±0.01	1.62



Initial charging

The whole charge should be carried out preferably at constant current. The charging time is inversely proportional to the current which is set by the current limit of the charging equipment .

Recommended rates and time for the first charging:

0.2C5 A for 10 hours
0.1C5 A for 20 hours

Pocket type battery construction features

Flame arresting vents
Material : Polypropylene.

Cell container
Material: Material:
Polypropylene or MBS.

Plate group bus
Connects the plate tabs with the terminal post. Plate tabs and terminal post are projection welded to the plate group bus

Plate frame
Seals the place pocket and serves as a current collector

Cell Cover
Material: Polypropylene or ABS.

Terminal
Material: Nickel Plated Steel

Separating grids
Separate the plates and insulate + the plate frames from each other. The grids allow free circulation of electrolyte between the plates

Plate
Horizontal pockets of doucble-perforated steel strips

Dimension of Ni-Cd batteries

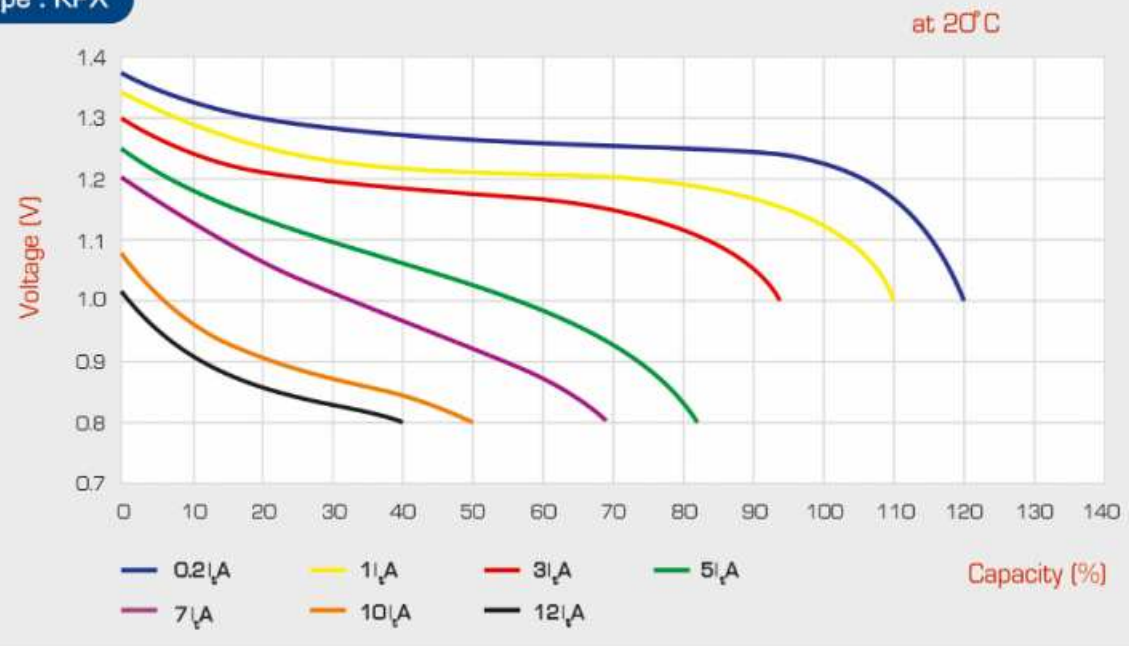
KPX Series

Cell Type	Nominal Capacity (Ah)	Cell Dimensions (mm)			Cell Weight (filled) (kg)	Electrolyte Volume (L)	Container Material
		Width	Length	Height			
KPX5	5	81	26	163	0.51	0.031	MBS
KPX10	10	81	26	163	0.62	0.031	MBS
KPX20	20	81	34	245	1.25	0.10	MBS
KPX30	30	81	43	266	1.68	0.165	MBS
KPX40	40	81	43	266	1.83	0.200	MBS
KPX50	50	81	50	266	2.10	0.210	MBS
KPX60	60	138	61	266	3.80	0.340	MBS
KPX70	70	138	61	266	4.00	0.330	MBS
KPX80	80	138	61	266	4.20	0.320	MBS
KPX90	90	138	61	266	4.31	0.310	MBS
KPX100	100	138	61	266	4.40	0.305	MBS
KPX120	120	138	61	266	4.80	0.305	MBS
KPX140	140	165	105	350	8.80	1.386	MBS
KPX170	170	165	105	350	10.00	1.680	MBS
KPX190	190	165	105	350	10.40	1.650	MBS
KPX210	210	165	105	350	10.5	1.620	MBS
KPX230	230	165	105	350	11.00	1.610	MBS

Discharge Curves (Battery is fully charged at 20 ± 5°C)

Nominal voltage : 1.2 V/Cell

Type : KPX



Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.14V per cell (KPX)

Cell Type	C (Ah)	Hours			Minutes		Seconds	
		5	1.5	1	5	1	5	1
KPX5	5	1.0	3.25	4.6	18.8	24.8	35.2	37.1
KPX10	10	2.0	6.5	9.3	37.5	49.5	70.5	142
KPX20	20	4.0	13	18.5	75	99	141	148
KPX30	30	6.0	19.5	27.8	113	148	211	222
KPX40	40	8.0	26	37	150	198	282	297
KPX50	50	10.0	32.5	46.3	188	247	352	371
KPX60	60	12.0	39	55.5	225	297	423	445
KPX70	70	14.0	45.5	64.8	262	346	493	519
KPX80	80	16.0	52	74	300	396	564	594
KPX90	90	18.0	58.5	83.3	338	445	634	668
KPX100	100	20.0	65	92.5	375	495	705	742
KPX120	120	24.0	78	111	450	594	846	891
KPX140	140	28.0	91	130	525	693	987	1039
KPX170	170	34.0	111	157	637	841	1198	1262
KPX190	190	38.0	124	176	712	940	1339	1410
KPX210	210	42.0	137	194	788	1040	1480	1558
KPX230	230	46.0	150	213	863	1138	1621	1707

Final discharge voltage 1.10V per cell (KPX)

Cell Type	C (Ah)	Hours			Minutes		Seconds	
		5	1.5	1	5	1	5	1
KPX5	5	1.03	3.3	4.8	22.1	30.6	36.6	45.9
KPX10	10	2.07	6.6	9.5	44.2	61.3	73.2	91.7
KPX20	20	4.1	13.3	19	88.5	123	146	183
KPX30	30	6.2	19.9	28.5	133	184	220	275
KPX40	40	8.3	26.6	38	177	245	293	367
KPX50	50	10.3	33.2	47.5	221	306	366	458
KPX60	60	12.4	39.9	57	265	368	439	550
KPX70	70	14.5	46.5	66.5	310	429	513	642
KPX80	80	16.5	53.2	76	354	490	586	734
KPX90	90	18.6	59.8	85.5	398	551	659	825
KPX100	100	20.7	66.5	95.0	442	612	732	917
KPX120	120	24.8	79.8	114	531	735	879	1101
KPX140	140	28.9	93	133	619	857	1025	1284
KPX170	170	35.1	113	162	752	1041	1245	1559
KPX190	190	39.3	125	181	840	1163	1391	1743
KPX210	210	43.4	140	200	929	1286	1538	1926
KPX230	230	47.5	153	219	1017	1412	1684	2110

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.05V per cell (KPX)

Cell Type	C (Ah)	Hours			Minutes		Seconds	
		5	1.5	1	5	1	5	1
KPX5	5	1.08	3.4	4.9	27.0	35.4	42.3	54.3
KPX10	10	2.2	6.8	9.8	54.0	70.7	84.7	109
KPX20	20	4.3	13.5	19.5	108	141	169	217
KPX30	30	6.5	20.3	29.3	162	212	254	326
KPX40	40	8.7	27.0	39.0	216	283	339	435
KPX50	50	10.8	33.8	48.8	270	354	423	543
KPX60	60	13.0	40.5	58.6	324	424	508	652
KPX70	70	15.2	47.3	68.3	378	495	593	761
KPX80	80	17.3	54.0	78.1	432	566	678	869
KPX90	90	19.5	60.8	87.8	486	636	762	978
KPX100	100	21.7	67.5	97.6	540	707	847	1087
KPX120	120	26.0	81.0	117	648	849	1017	1304
KPX140	140	30.3	94.5	137	756	990	1186	1521
KPX170	170	36.8	115	166	918	1202	1440	1847
KPX190	190	41.2	128	185	1026	1344	1610	2065
KPX210	210	45.5	142	205	1134	1485	1778	2282
KPX230	230	49.8	155	224	1242	1626	1947	2499

Final discharge voltage 1.00V per cell (KPX)

Cell Type	C (Ah)	Hours			Minutes		Seconds	
		5	1.5	1	5	1	5	1
KPX5	5	1.1	3.45	5.1	34	45.6	53.4	62.1
KPX10	10	2.2	6.9	10.2	68	91.2	107	124
KPX20	20	4.4	13.8	20.2	130	182	213	248
KPX30	30	6.6	20.7	30.8	204	274	320	373
KPX40	40	8.8	27.6	41.0	261	265	426	497
KPX50	50	11	34.5	51.3	340	456	534	621
KPX60	60	13.2	41.2	61.4	408	547	640	745
KPX70	70	15.4	48.1	71.7	476	638	747	869
KPX80	80	17.6	54.9	81.9	544	730	854	994
KPX90	90	19.8	61.8	92.2	612	821	960	1118
KPX100	100	22	68.7	102	680	912	1067	1242
KPX120	120	26.4	82.4	123	816	1094	1281	1491
KPX140	140	30.5	96.0	143	952	1277	1494	1739
KPX170	170	37	117	174	1156	1550	1814	2112
KPX190	190	41.4	130	194	1292	1733	2027	2360
KPX210	210	45.7	144	215	1428	1915	2240	2609
KPX230	230	50.1	158	235	1564	2098	2454	2857

Dimension of Ni-Cd batteries

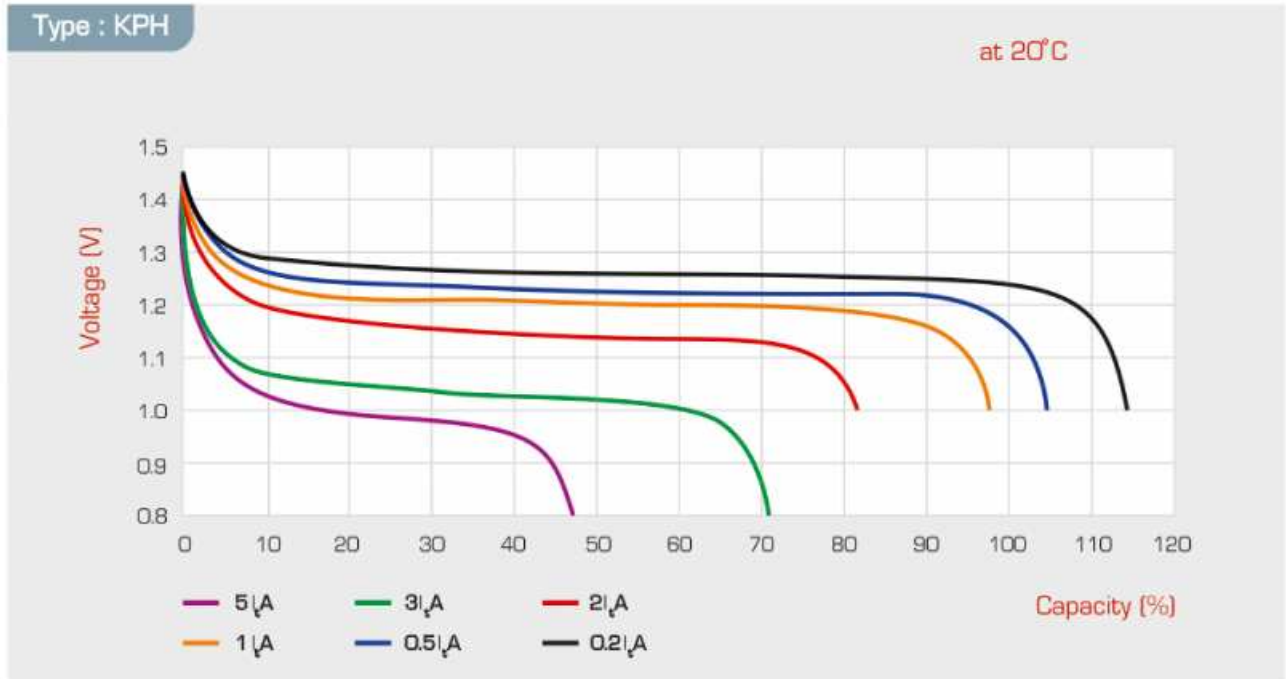
KPH Series

Cell Type	Nominal Capacity (Ah)	Cell Dimensions (mm)			Cell Weight (filled) (kg)	Electrolyte Volume (L)	Container Material
		Width	Length	Height			
KPH40	40	139	79	291	4.50	1.30	ABS or MBS
KPH50	50	139	79	291	6.00	1.60	ABS or MBS
KPH60	60	139	79	362	6.50	1.70	ABS or MBS
KPH70	70	139	79	362	9.00	1.80	ABS or MBS
KPH80	80	164	104	345	9.50	2.00	ABS or MBS
KPH100	100	164	104	345	13.00	3.00	ABS or MBS
KPH125	125	167	162	343	13.50	3.50	ABS or MBS
KPH150	150	286	174	348	23.00	5.00	ABS or MBS
KPH200	200	286	174	348	24.50	5.00	ABS or MBS
KPH250	250	232	172	410	27.00	5.50	ABS or MBS
KPH300	300	291	174	505	33.00	6.50	ABS or MBS
KPH350	350	291	174	505	34.50	7.00	ABS or MBS
KPH400	400	291	174	505	36.00	7.50	ABS or MBS
KPH500	500	398	184	562	53.00	15.00	ABS or MBS

Discharge Curves (Battery is fully charged at 20 ± 5°C)

Nominal voltage : 1.2 V/Cell

Type : KPH



Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.14V per cell (KPH)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPH30	30	3.73	5.97	9.38	15.4	22.4	68.0	103	147	154
KPH50	50	6.23	9.95	15.6	25.7	37.4	113	172	246	257
KPH70	70	8.72	13.9	21.8	36.0	52.4	158	241	345	360
KPH100	100	12.4	19.9	31.2	51.4	74.8	226	345	493	514
KPH125	125	14.9	23.8	37.5	61.7	89.8	272	414	591	617
KPH150	150	18.6	29.8	46.9	77.2	112	340	518	739	772
KPH200	200	24.9	39.8	62.5	102	149	453	691	986	1029
KPH300	300	37.3	59.7	93.8	154	224	680	703	1479	1544
KPH350	350	43.6	69.6	109	180	262	793	1209	1726	1801
KPH400	400	49.8	79.6	125	205	299	907	1382	1972	2059
KPH500	500	62.3	99.5	156	257	374	1134	1728	2466	2574

Final discharge voltage 1.10V per cell (KPH)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPH30	30	3.79	6.06	9.57	17.4	24.3	85.3	115	168	185
KPH50	50	6.32	10.1	15.9	29.1	40.5	142	192	280	309
KPH70	70	8.84	14.1	22.3	40.8	56.7	199	269	393	433
KPH100	100	12.6	20.2	31.9	58.3	81.0	284	385	561	619
KPH125	125	15.1	24.2	38.3	69.9	97.0	341	462	673	743
KPH150	150	18.9	30.3	47.8	87.4	121	426	577	842	928
KPH200	200	25.2	40.4	63.8	116	162	568	770	1123	1238
KPH300	300	37.9	60.6	95.7	174	243	853	1155	1684	1857
KPH350	350	44.2	70.8	111	204	283	995	1348	1965	2167
KPH400	400	50.5	80.9	127	233	324	1137	1540	2246	2476
KPH500	500	63.2	101	159	291	405	1422	1926	2808	3096

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.05V per cell (KPH)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPH30	30	3.81	6.10	10.7	17.9	24.9	110	144	209	228
KPH50	50	6.35	10.1	17.9	29.8	41.5	183	241	349	381
KPH70	70	8.89	14.2	25.1	41.8	58.2	257	337	488	534
KPH100	100	12.7	20.3	35.9	59.7	83.1	367	482	698	763
KPH125	125	15.2	24.4	43.1	71.7	99.7	440	578	838	915
KPH150	150	19.0	30.5	53.8	89.6	124	550	723	1047	1144
KPH200	200	25.4	40.6	71.8	119	166	734	964	1396	1526
KPH300	300	38.1	61.0	107	179	249	1101	1447	2095	2289
KPH350	350	44.4	71.1	125	207	291	1285	1688	2444	2671
KPH400	400	50.8	81.3	143	239	332	1468	1929	2793	3052
KPH500	500	63.5	101	179	293	415	1836	2412	3492	3816

Final discharge voltage 1.00V per cell (KPH)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPH30	30	3.84	6.14	10.9	18.9	27.0	118	152	232	264
KPH50	50	6.41	10.2	18.2	32.0	44.9	198	253	387	441
KPH70	70	8.97	14.3	25.5	43.1	60.0	277	355	542	617
KPH100	100	12.8	20.4	36.4	62.5	91.1	396	507	774	882
KPH125	125	15.3	24.5	43.7	76.2	109	475	609	929	1007
KPH150	150	19.2	30.7	54.7	94.1	136	594	761	1161	1323
KPH200	200	25.6	44.9	72.9	125	181	792	1015	1584	1764
KPH300	300	38.4	61.4	109	187	270	1188	1522	2323	2646
KPH350	350	44.8	71.6	127	218	315	1386	1776	2710	3087
KPH400	400	51.2	81.9	145	249	359	1584	2030	3097	3528
KPH500	500	64.1	102	182	311	448	1980	2538	3871	4410

Dimension of Ni-Cd batteries

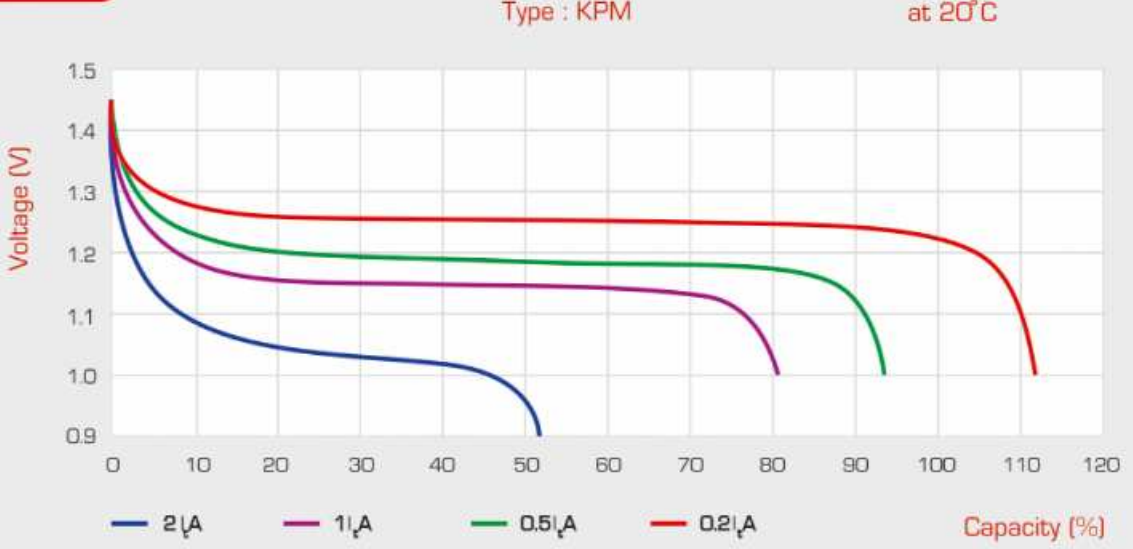
KPM Series

Cell Type	Electric Votage (V)	Rated Capacity (Ah)	Cell Dimensions (mm)			Thread of pole	Cell Weight (filled) (kg)	Electrolyte Volume (L)	Container Material
			Length	Width	Height				
KPM10	1.2	10	81	33.5	245	M10	0.90	0.20	ABS or MBS
KPM20	1.2	20	136	56	264	M10x1.5	1.90	0.60	PP
KPM30	1.2	30	136	56	264	M10x1.5	2.40	0.60	PP
KPM40	1.2	40	138	61	266	M10x1.5	2.90	0.60	ABS or MBS
KPM50	1.2	50	139	79	291	M10x1.5	5.00	1.30	ABS or MBS
KPM60	1.2	60	139	79	291	M10x1.5	5.10	1.20	ABS or MBS
KPM75	1.2	75	139	79	361	M16	6.50	1.70	ABS or MBS
KPM100	1.2	100	164	104	345	M20x1.5	9.30	1.80	ABS or MBS
KPM120	1.2	120	167	162	343	M20x1.5	11.80	3.00	ABS or MBS
KPM120-(4)	1.2	120	139	89	362	M16	7.50	1.30	ABS or MBS
KPM150	1.2	150	167	162	343	M20x1.5	12.50	2.70	ABS or MBS
KPM200	1.2	200	167	162	343	M20x1.5	13.50	2.70	ABS or MBS
KPM250	1.2	250	286	174	348	M20x1.5	26.00	5.90	ABS or MBS
KPM300	1.2	300	286	174	348	M20x1.5	27.00	5.83	ABS or MBS
KPM400	1.2	400	286	174	501	M20x1.5	39.00	9.00	ABS or MBS
KPM500	1.2	500	286	174	501	M20x1.5	41.00	9.00	ABS or MBS
KPM600	1.2	600	286	174	501	M20x1.5	43.00	9.00	ABS or MBS
KPM700	1.2	700	390	176	557	M20x1.5	61.50	16.00	ABS or MBS
KPM800	1.2	800	390	176	557	M20x1.5	64.00	15.00	ABS or MBS

Discharge Curves (Battery is fully charged at 20 ± 5°C)

Nominal voltage : 1.2 V/Cell

Type : KPM



Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.14V per cell (KPM)

Cell Type	C (Ah)	Hours				Minutes		Seconds	
		5	3	1.5	1	5	1	5	1
KPM10	10	1.73	2.8	3.8	4.4	9.9	14.7	19.8	22.0
KPM20	20	3.7	5.5	7.8	8.6	19.2	27.1	36.4	44.0
KPM30	30	5.6	8.2	11.3	12.9	28.9	40.6	53.0	67.0
KPM40	40	7.5	10.9	15.0	17.3	38.6	54.2	71.0	90.0
KPM50	50	9.5	15	24.5	28.5	56	79.5	104.5	115
KPM60	60	11.4	16	27	32	67.2	95.4	125.4	138
KPM75	75	13.4	18	29.4	34.5	71.5	103	135	140
KPM100	100	19	26	46	54.5	112	159	209	230
KPM120	120	22.4	30.7	49	57	122	174	230	238
KPM150	150	28.5	45	73.5	85.5	168	238.5	313.5	345
KPM200	200	38	60	98	114	224	318	418	460
KPM250	250	47.5	75	122.5	142.5	280	397.5	522.5	575
KPM300	300	57	90	147	171	336	477	627	690
KPM350	350	66.5	105	171.5	199.5	392	556.5	731.5	805
KPM400	400	76	120	196	228	448	636	836	920
KPM500	500	95	150	245	285	560	795	1045	1150
KPM600	600	114	180	294	342	672	954	1254	1380
KPM800	800	152	240	392	456	896	1272	1672	1840

Final discharge voltage 1.10V per cell (KPM)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPM10	10	1.23	1.94	2.91	4.51	5.61	12.6	17.9	25	27
KPM20	20	2.44	3.89	5.83	9.03	11.3	25.3	35.5	48.8	52
KPM30	30	3.7	5.82	8.73	13.5	16.8	37.8	53	72.2	79
KPM40	40	5	7.76	11.6	18.1	22.4	50.4	71	96.1	104
KPM50	50	6	9.75	15.5	27.5	33.5	67.5	87.5	115	135
KPM60	60	7.2	11.7	18.6	30.1	37	81	105	138	162
KPM75	75	8.8	13.8	21	33	41	88.6	126	169	185
KPM100	100	12	19.5	31	50	58	135	175	230	270
KPM120	120	14.8	23.4	35	54.5	67.7	154.4	221	296	323.5
KPM150	150	18	29.25	46.5	82.5	100.5	202.5	262.5	345	405
KPM200	200	24	39	62	110	134	270	350	460	540
KPM250	250	30	48.75	77.5	137.5	167.5	337.5	437.5	575	675
KPM300	300	36	58.5	93	165	201	405	525	690	810
KPM350	350	42	68.25	108.5	192.5	234.5	472.5	612.5	805	945
KPM400	400	48	78	124	220	268	540	700	920	1080
KPM500	500	60	97.5	155	275	335	675	875	1150	1350
KPM600	600	72	117	186	330	402	810	1050	1380	1620
KPM800	800	96	156	248	440	536	1080	1400	1840	2160

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.05V per cell (KPM)

Cell Type	C (Ah)	Hours				Minutes		Seconds	
		5	3	1.5	1	5	1	5	1
KPM10	10	1.96	3.22	5.0	6.4	14.9	22.3	31	33.9
KPM20	20	3.92	6.44	10.1	12.8	29.8	44.3	63	68
KPM30	30	5.88	9.66	15.1	19.2	44.7	66.7	94	101
KPM40	40	7.84	12.9	20.0	25.6	59.6	89	125	136
KPM50	50	9.9	16	28.25	35	82.5	105	145	156
KPM60	60	11.88	19.2	33.9	42	99	126	174	187.2
KPM75	75	14	22.5	35.9	47	111	156	212	228
KPM100	100	19.8	32	56.5	70	165	210	290	312
KPM120	120	24	38.9	61.3	81	189	266	365	389
KPM150	150	29.7	48	84.75	105	247.5	315	435	468
KPM200	200	39.6	64	113	140	330	420	580	624
KPM250	250	49.5	80	141.25	175	412.5	525	725	780
KPM300	300	59.4	96	169.5	210	495	630	870	936
KPM350	350	69.3	112	197.75	245	577.5	735	1015	1092
KPM400	400	79.2	128	226	280	660	840	1160	1248
KPM500	500	99	160	282.5	350	825	1050	1450	1560
KPM600	600	118.8	192	339	420	990	1260	1740	1872
KPM800	800	158.4	256	452	560	1320	1680	2320	2496

Final discharge voltage 1.00V per cell (KPM)

Cell Type	C (Ah)	Hours				Minutes		Seconds	
		5	3	1.5	1	5	1	5	1
KPM10	10	2.0	3.26	5.78	7.5	19.1	26.7	37.1	39.5
KPM20	20	4.0	6.53	11.6	15.1	38.1	53.4	74.1	79
KPM30	30	6.0	9.81	17.4	22.4	57.1	80.2	112	118
KPM40	40	8.0	13.2	23.2	29.9	76.1	108	148	159
KPM50	50	10	16.5	30.5	41	96	120	155	182.5
KPM60	60	12	19.6	36.6	49.2	115.2	144	186	219
KPM75	75	14	23	40.5	52.5	133	188	260	276
KPM100	100	20	33	61	82	192	240	310	365
KPM120	120	24.1	39.9	69.4	90	228	321	444	474
KPM150	150	30	49.5	91.5	123	288	360	465	547.5
KPM200	200	40	66	122	164	384	480	620	730
KPM250	250	50	82.5	152.5	205	480	600	775	912.5
KPM300	300	60	99	183	246	576	720	930	1095
KPM350	350	70	115	213.5	287	672	840	1085	1277.5
KPM400	400	80	132	244	328	768	960	1240	1460
KPM500	500	100	165	305	410	960	1200	1550	1825
KPM600	600	120	198	366	492	1152	1440	1860	2190
KPM800	800	161	264	460	590	1389	1710	2400	2601

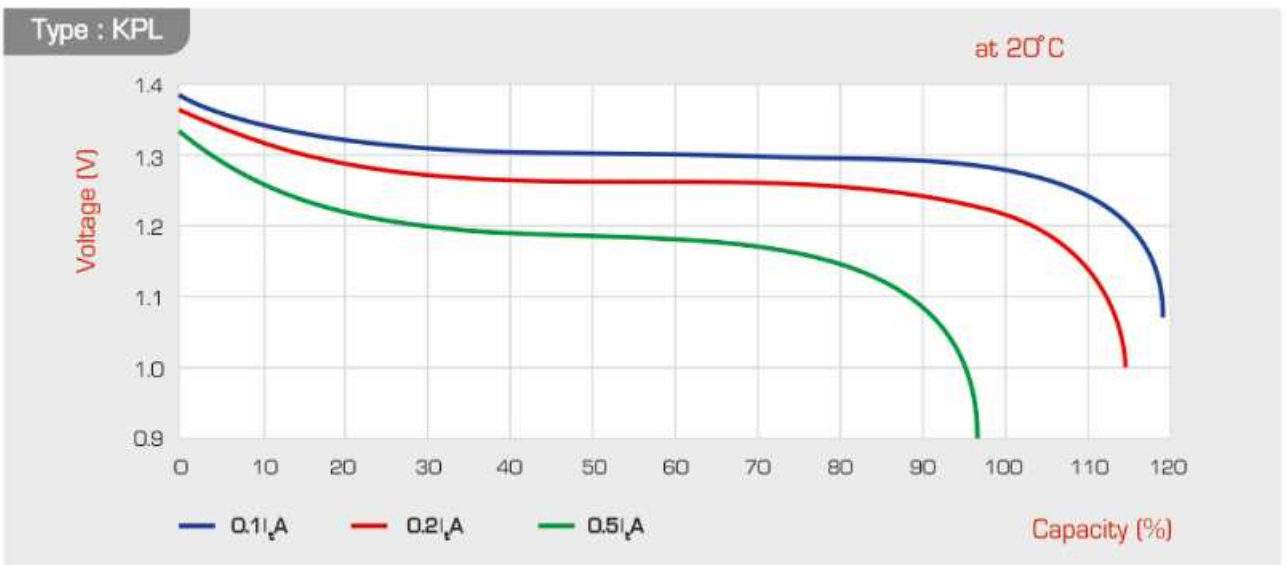
KPL Series

Cell Type	Rated Capacity (Ah)	Electric Votage (V)	Cell Dimensions (mm)			Thread of pole	Cell Weight (filled) (kg)	Electrolyte Volume (L)	Container Material
			Length	Width	Height				
KPL10-(2)	10	1.2	85	39	136	M5	0.70	0.15	ABS or MBS
KPL20	20	1.2	82	43	260	M10x1.5	1.2	0.25	ABS or MBS
KPL22	22	1.2	112	31	220	M8	1.3	0.13	MBS
KPL30	30	1.2	136	56	264	M10x1.5	2.04	0.54	PP
KPL40	40	1.2	136	56	264	M10x1.5	2.25	0.54	PP
KPL45	45	1.2	136	56	264	M10x1.5	2.45	0.54	PP
KPL50-(2)	50	1.2	138	61	266	M10x1.5	3.2	0.7	ABS or MBS
KPL60-(2)	60	1.2	135	52	373	M10x1.5	3.9	1.0	ABS or MBS
KPL60	60	1.2	141	71	295	M10x1.5	4.5	1.5	ABS or MBS
KPL100-(2)	100	1.2	139	79	362	M10x1.5	6.5	1.7	ABS or MBS
KPL120	120	1.2	139	89	362	M10x1.5	7.2	2.0	PP
KPL150	150	1.2	167	162	343	M20x1.5	13.0	3.3	ABS or MBS
KPL200	200	1.2	167	162	343	M20x1.5	14.0	3.3	ABS or MBS
KPL250	250	1.2	167	162	343	M20x1.5	19.0	5.0	ABS or MBS
KPL250-(3)	250	1.2	277	139	420	M16	19.0	5.0	ABS or MBS
KPL300-(3)	300	1.2	277	145	450	M16	21.0	6.0	PP
KPL400	400	1.2	286	174	348	M20x1.5	37.2	6.0	ABS or MBS
KPL500	500	1.2	290	174	505	M20x1.5	39.0	5.0	ABS or MBS
KPL600	600	1.2	290	174	505	M20x1.5	50.0	6.0	ABS or MBS
KPL800	800	1.2	398	184	572	M20x1.5	63.0	18.3	ABS or MBS
KPL1000	1000	1.2	398	184	572	M20x1.5	73.0	18.3	ABS or MBS
KPL1200	1200	1.2	398	184	572	M20x1.5	80	18.3	ABS or MBS

Discharge Curves (Battery is fully charged at 20 ± 5°C)

Nominal voltage : 1.2 V/Cell

Type : KPL



Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.14V per cell (KPL)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPL10	10	1.15	1.89	2.9	4.3	5.1	9.3	11	13	13.5
KPL20	20	2.3	3.78	5.8	8.6	10.2	18.6	22	26	27
KPL22	22	2.53	4.158	6.38	8.8	11.22	20.46	24.2	28.6	29.7
KPL30	30	3.45	5.67	8.7	12.9	15.3	27.9	33	39	40.5
KPL40	40	4.6	7.56	11.6	17.2	20.4	37.2	44	52	54
KPL50	50	5.75	9.45	14.5	21.5	25.5	46.5	55	65	67.5
KPL60	60	6.9	11.34	17.4	25.8	30.6	55.8	66	78	81
KPL100	100	11.5	18.9	29	43	51	93	110	130	135
KPL130	130	14.95	24.57	37.7	55.9	66.3	120.9	143	169	175.5
KPL150	150	17.25	28.35	43.5	64.5	76.5	139.5	165	195	202.5
KPL165	165	18.975	31.185	47.85	70.95	84.15	153.45	181.5	214.5	222.75
KPL200	200	23	37.8	58	86	102	186	220	260	270
KPL240	240	27.6	45.36	69.6	103.2	122.4	223.2	264	312	324
KPL250	250	28.75	47.25	72.5	107.5	127.5	232.5	275	325	337.5
KPL300	300	34.5	56.7	87	129	153	279	330	390	405
KPL350	350	40.25	66.15	101.5	150.5	178.5	325.5	385	455	472.5
KPL400	400	46	75.6	116	172	204	372	440	520	540
KPL500	500	57.5	94.5	145	215	255	465	550	650	675
KPL600	600	69	113.4	174	258	306	558	660	780	810
KPL800	800	92	151.2	232	344	408	744	880	1040	1080
KPL1000	1000	115	189	290	430	510	930	1100	1300	1350
KPL1200	1200	120	193	299	436	517	942	1112	1314	1365

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.10V per cell (KPL)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPL10	10	1.21	1.95	2.97	4.6	5.5	9.5	11.5	14	14.5
KPL20	20	2.42	3.9	5.94	9.2	11	19	23	28	29
KPL22	22	2.662	4.29	6.534	10.12	12.1	20.9	25.3	30.8	31.9
KPL30	30	3.63	5.85	8.91	13.8	16.5	28.5	34.5	42	43.5
KPL40	40	4.84	7.8	11.88	18.4	22	38	46	56	58
KPL50	50	6.05	9.75	14.85	23	27.5	47.5	57.5	70	72.5
KPL60	60	7.26	11.7	17.82	27.6	33	57	69	84	87
KPL100	100	12.1	19.5	29.7	46	55	95	115	140	145
KPL130	130	15.73	25.35	38.61	59.8	71.5	123.5	149.5	182	188.5
KPL150	150	18.15	29.25	44.55	69	82.5	142.5	172.5	210	217.5
KPL165	165	19.965	32.175	49.0	75.9	90.75	156.75	189.75	231	239.25
KPL200	200	24.2	39	59.4	92	110	190	230	280	290
KPL240	240	29.04	46.8	71.28	110.4	132	228	276	336	348
KPL250	250	30.25	48.75	74.25	115	137.5	237.5	287.5	350	362.5
KPL300	300	36.3	58.5	89.1	138	165	285	345	420	435
KPL350	350	42.35	68.25	103.95	161	192.5	332.5	402.5	490	507.5
KPL400	400	48.4	78	118.8	184	220	380	460	560	580
KPL500	500	60.5	97.5	148.5	230	275	475	575	700	725
KPL600	600	72.6	117	178.2	276	330	570	690	840	870
KPL800	800	96.8	156	237.6	368	440	760	920	1120	1160
KPL1000	1000	121	195	297	460	550	950	1150	1400	1450
KPL1200	1200	124	201	300	470	561	960	1158	1420	1470

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

Final discharge voltage 1.05V per cell (KPL)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPL10	10	1.25	1.98	3	4.68	6.05	11.5	14	16.5	17
KPL20	20	2.5	3.96	6	9.36	12	23	28	33	34
KPL22	22	2.75	4.356	6.6	10.296	13.3	25.3	30.8	36.3	37.4
KPL30	30	3.75	5.94	9	14.04	18.15	34.5	42	49.5	51
KPL40	40	5	7.92	12	18.72	24.2	46	56	66	68
KPL50	50	6.25	9.9	15	23.4	30.2	57.5	70	82.5	85
KPL60	60	7.5	11.88	18	28.08	36.3	69	84	99	102
KPL100	100	12.5	19.8	30	46.8	60.5	115	140	165	170
KPL130	130	16.25	25.74	39	60.84	78.6	149.5	182	214.5	221
KPL150	150	18.75	29.7	45	70.2	90.75	172.5	210	247.5	255
KPL165	165	20.625	32.67	49.5	77.22	100	189.75	231	272.25	280.5
KPL200	200	25	39.6	60	93.6	121	230	280	330	340
KPL240	240	30	47.52	72	112.32	145.1	276	336	396	408
KPL250	250	31.25	49.5	75	117	151.2	287.5	350	412.5	425
KPL300	300	37.5	59.4	90	140.4	181.5	345	420	495	510
KPL350	350	43.75	69.3	105	163.8	211.7	402.5	490	577.5	595
KPL400	400	50	79.2	120	187.2	242	460	560	660	680
KPL500	500	62.5	99	150	234	302.5	575	700	825	850
KPL600	600	75	118.8	180	280.8	362.5	690	840	990	1020
KPL800	800	100	158.4	240	374.4	484	920	1120	1320	1360
KPL1000	1000	125	198	300	468	605	1115	1140	1465	1570
KPL1200	1200	140	205	310	482	679	1151	1180	1489	1609

Dimension of Ni-Cd batteries

Discharge currents and time when battery is fully charged at 20±5°c

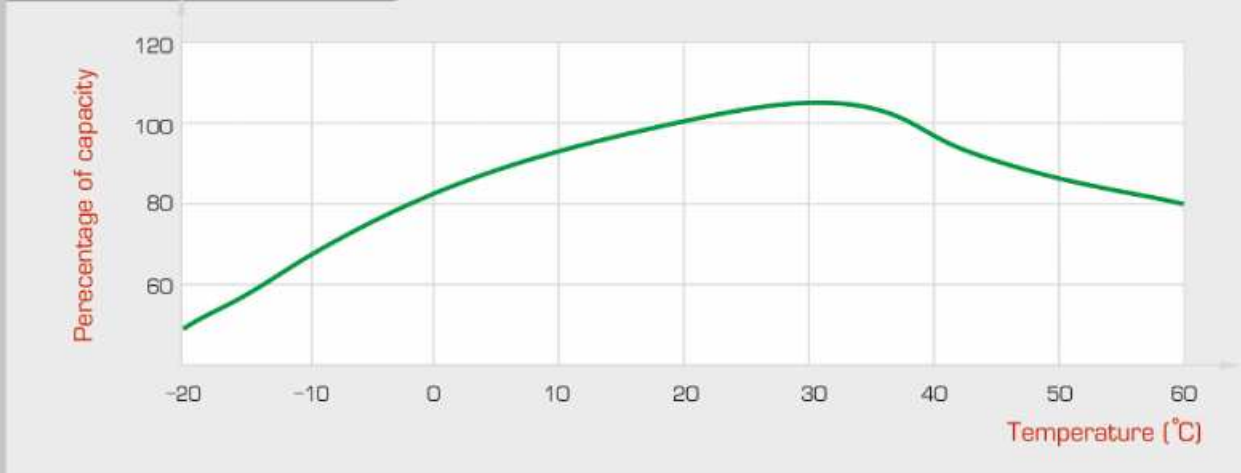
Final discharge voltage 1.00V per cell (KPL)

Cell Type	C (Ah)	Hours					Minutes		Seconds	
		8	5	3	1.5	1	5	1	5	1
KPL10	10	1.27	2	3.1	5.1	6.6	12.6	16.4	19.2	19.5
KPL20	20	2.54	4	6.2	10.2	13.2	25.2	32.8	38.4	39
KPL22	22	2.794	4.4	6.82	11.22	14.52	27.72	36.08	42.24	42.9
KPL30	30	3.81	6	9.3	15.3	19.8	37.8	49.2	57.6	58.5
KPL40	40	5.08	8	12.4	20.4	26.4	50.4	65.6	76.8	78
KPL50	50	6.35	10	15.5	25.5	33	63	82	96	97.5
KPL60	60	7.62	12	18.6	30.6	39.6	75.6	98.4	115.2	117
KPL100	100	12.7	20	31	51	66	126	164	192	195
KPL130	130	16.51	26	40.3	66.3	85.8	163.8	213.2	249.6	253.5
KPL150	150	19.05	30	46.5	76.5	99	189	246	288	292.5
KPL165	165	21.0	33	51.15	84.15	108.9	207.9	270.6	316.8	321.75
KPL200	200	25.4	40	62	102	132	252	328	384	390
KPL240	240	30.48	48	74.4	122.4	158.32	302.4	393.6	460.8	468
KPL250	250	31.75	50	77.5	127.5	165	315	410	480	487.5
KPL300	300	38.1	60	93	153	198	378	492	576	585
KPL350	350	44.45	70	108.5	178.5	231	441	574	672	682.5
KPL400	400	50.8	80	124	204	264	504	656	768	780
KPL500	500	63.5	100	155	255	330	630	820	960	975
KPL600	600	76.2	120	186	306	396	756	984	1152	1170
KPL800	800	101.6	160	248	408	528	1008	1312	1536	1560
KPL1000	1000	127	200	310	510	660	1260	1640	1920	1950
KPL1200	1200	137	215	321	529	689	1286	1691	1960	2037

The Curve of effect of temperature

On the capacity under the discharge current of 0.2 ItA

The capacity is 100% at 20°C



The selection of electrolyte and technical requirement.

The selections of electrolyte are determined by operating temperature of the battery

No	Operating temp. ˚C	Density (g/cm³)	Composition of electrolyte	Weight ratio (alkaline : water)
1	10~45	1.18 ± 0.02	NaOH+20g/L LiOH • H_2O	1 : 5
2	**10~35**	**1.20 ± 0.02**	**KOH+30g/L LiOH • H_2O**	**1 : 3**
3	-25~10	1.25 ± 0.01	KOH	1 : 2
4	-40~15	1.28 ± 0.01	KOH	1 : 2

The technical requirements of electrolyte

(The reference density is 1.20±0.02gcm3)

Items	Technical requirements	
	New electrolyte	Limiting value during operation
Outward appearance	Colorless, transparent, no suspended substance	
Density(15°C)	1.20±0.02	1.20±0.02
Content(g/L)	KOH : 240~270,NaOH : 215~240	KOH : 240~270,NaOH : 215~240
Cl-(g/L)	<0.1	0.2
K_2CO_3(g/L)	<20	60
Ca^{2+}•Mg^{2+}(g/L)	<0.19	0.3
Fe/KOH (NaOH)(%)	<0.05	0.05

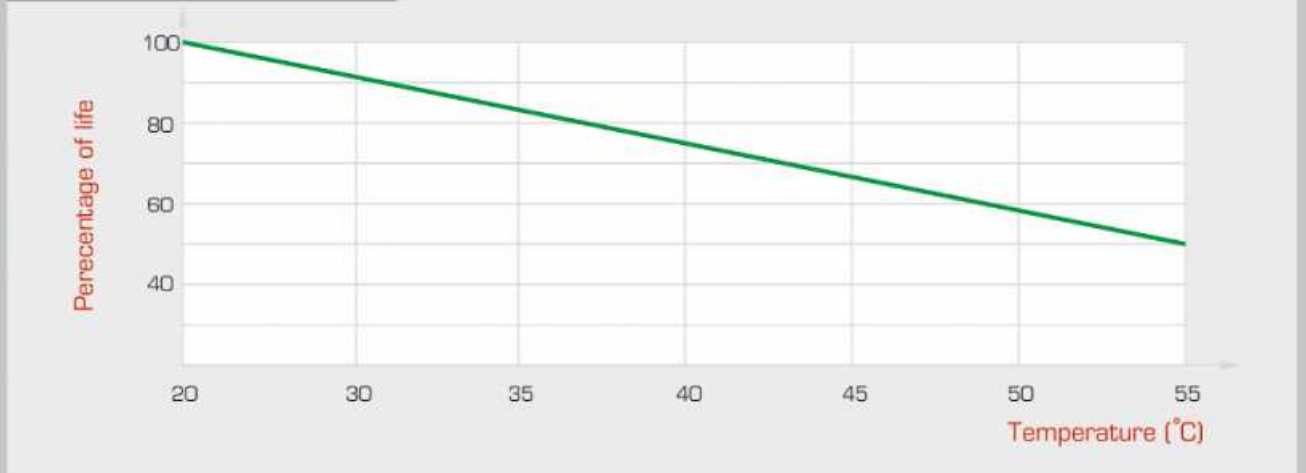
Technical requirements for raw material

KOH: chemical pure
NaOH: chemical pure
LiOH•H_2O: industrial pure, LiOH content should not be less than 50%.

Water: distilled water, ion-exchange water, softened water or electro osmosis water

The Curve of effect of temperature on life

The capacity is 100% at 20°C



Information required for battery capacity calculation We need following basic information for a precise battery capacity calculation.

- Nominal voltage of the system
- standby period
- minimum voltage
- battery compartment layout
- load current
- maximum voltage (for charging)
- temperature range

Float Voltage Operation

The float voltage will have to be decided based on the battery type in the required condition.

$$\text{Number of cells required} = \frac{\text{circuit voltage}}{\text{Cell Float voltage}} \qquad \text{Minimum cell voltage} = \frac{\text{Minimum D.C. Voltage}}{\text{Number of cells}}$$

The most commonly used float voltages are 1.40-1.48 voltages per cell, but the exact figure has to be decided carefully to the circumstances

Example

A **POLARIT** battery is required to maintain an inverter load of 50KVA at 0.8 power factor for a back up time of 60 minutes (1 Houre), at normal temperature.
The D.C Voltage to the Voltage to the inverter operates within the maximum voltage limit of 265 V with the float charge to the minimum voltage limit of 202 V at the end of back up time. The inverter has 85 % efficiency.

$$\text{Number of cells (at recommended float of 1.44v.p.c)} = \frac{265}{1.44} = 184 \text{ cells}$$

$$\text{Minimum cell voltage} = \frac{202}{184} = 1.10 \text{ Voltage per cell}$$

$$\text{Maximum Battery current} = \frac{\text{Inverter Load in KVA x power facter}}{\text{Min. cell voltage x number of cells}}$$

$$= \frac{50\text{KVA} \times 0.8}{1.10 \times 184} = 197.6 \text{ Amps}$$

We shall choose the battery with capacity equal or above the calculated value.
Battery type (determined by discharge time): KPM
From page 12, the cell model is determined as KPM300.

The Number of Cells in battery

The number of cells in a battery may be determined by simply dividing the normal voltage of the system by the voltage of a single cell (1.2V)

System voltage	Number of cells	Spread in the practice
24	20	18~21
36	30	27~21
48	40	36~41
110	592	88~93
220	184	180~186

POLARIT Batteries

Nickel-Cadmium (Ni-Cd) Batteries

www.becafzar.com / www.polaritbattery.com