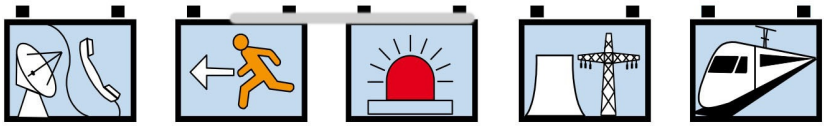
PlatinIran®
Sustainable Energy

V4.4

Guarantee

NiCd Pocket Plate Range
PT1.2FPM10-1100

»Premium quality for uninterrupted communication«



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NiCd Pocket Plate Range

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NiCd Pocket Plate Range
PT1.2FPM10-1100

The block battery - for dependability

The wide range of low, medium and high capacity types makes accurate selection easy, based on discharge time and end of discharge voltage. Robust construction and generous electrolyte reserve enable the battery to withstand wide temperature fluctuations in stationary cycling behavior over its 20+ years' life.

Built with a future Nickel-cadmium plates are completely reliable, with no risk of thermal runaway or sudden death.

Generally operating between temperatures of –40˚C to +60˚C (-40˚F to +140˚F), they can tolerate extremes of -50˚C to +70˚C (-58˚F to +158˚F) for short periods.

With only periodic checks, the block battery will provide up to 20+ years' completely faithful service.

Trouble-free long cycle life

The NILE nickel-cadmium block battery's unique electrochemistry enables it to regularly withstand any depth of discharge.

Following a deep discharge the block battery is designed to recharge very quickly and economically, using standard single or two-level charging equipment.

Be sure of a low overall cost

The Ni-Cd block battery is the most highly cost-efficient solution to stored power requirements.

- No downtime
- No replacement costs
- Minimal maintenance
- Ease of installation
- 20+ years' operating life.

Easy storage and installation

Nickel-cadmium block batteries are quick and easy to install as original equipment and may be stored for many years in a discharged state under correct conditions.

On installation a simple bolted connector enables the battery to be rapidly commissioned.

Assured reliability

Ni-Cd is equally dependable in controlled city environments or harsh, unpredictable conditions in the world's most remote and unpopulated areas.

The Ni-Cd battery's block construction makes it highly resistant to electrical abuse and transport over rough terrain, precluding risk of subsequent failure.

Optimized for performance:

An electrolyte solution of potassium hydroxide and a small amount of lithium hydroxide acts only as an ion transfer medium, delivering optimum performance without causing base material degradation.

Good reserves and circulation of the electrolyte are achieved by a wide inter-plate space.

Injection molded plastic grids both separate plate and insulate plate edges. For extremely low temperatures a special high density electrolyte is available.

The block battery is fitted with a specially designed flame arresting flip top vent and does not produce corrosive vapors. The tough polypropylene casing ensures the battery's structural integrity throughout its long life.

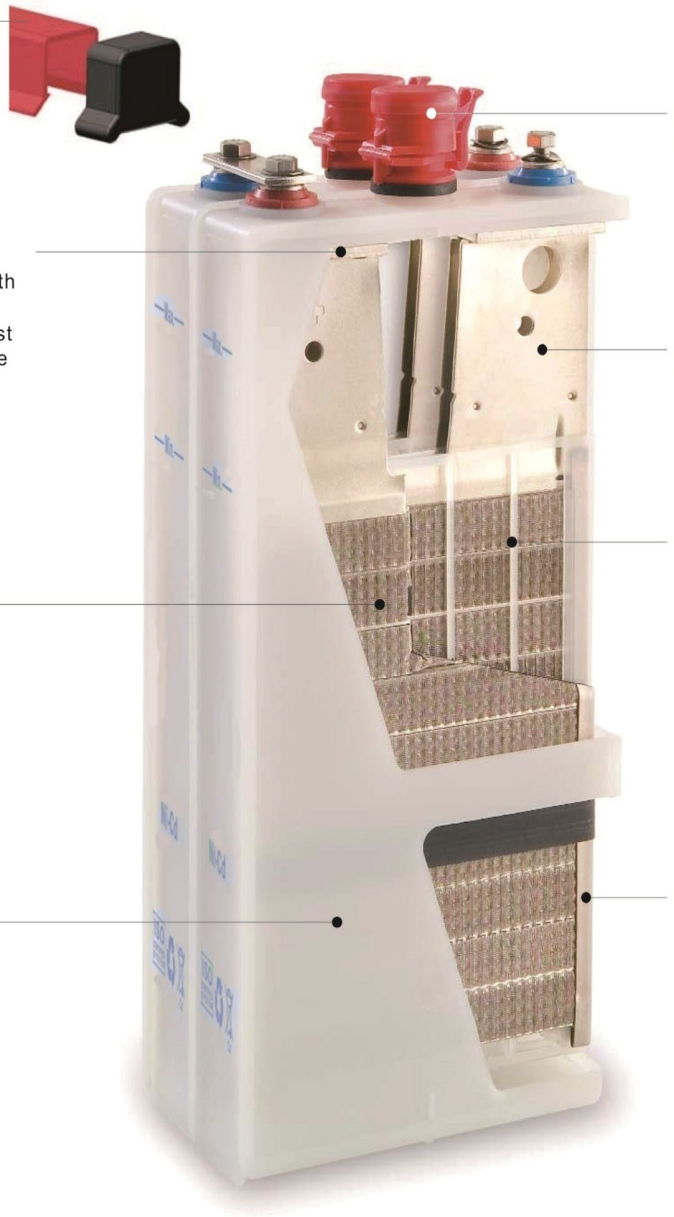
Supports these Single Cell ranges with:

- Quality approved manufacture to ISO 9001 and the TUV certification
- Single Cell batteries have been developed in line with the safety requirements of EN-50272-2 and components used (such as insulated cable connectors and end lug covers) are defined to ensure high protection against electric shocks (Ip2 level).
- Full recycling service to protect the environment

ISO 9001 14001 CE TÜVRheinland Cd

VRNC

NiCd Pocket Plate Range



The cells are welded together to form rugged blocks of 1-6 cells depending on the cell size and type.

The NILE Single Cell ranges fully comply and exceed the IEC 60623 standard requirements.

Performance Data

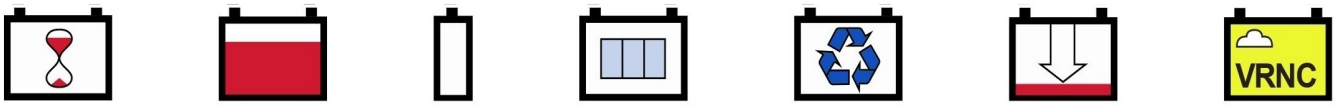
Many nickel-cadmium batteries are used in stationary standby power applications where discharges occur infrequently and the battery is continuously charged by a float or constant potential charge.

Under these circumstances there is a modification in the level of the discharge curve and allowances must be made for this when sizing the battery.

In order to simplify this process, the data NILE supplies in this publication has both the fully charged data to IEC 60623 and the fully charged data after prolonged float charge, which can be used directly in battery sizing calculations.

This phenomenon occurs with all nickel-cadmium batteries, but some other manufacturers of nickel- cadmium batteries may not take this effect into account in published data.

When calculating for deep discharges (0.65 V and 0.85 V) it is not necessary to take this effect into account.



Battery Charging

It is recommended to use Constant Voltage method of charging for Nickel Cadmium Batteries, usually with current limitation to C/5 or C/10. Charging voltages must be regularly checked. To optimize the battery performance, it is necessary to ensure that the voltage is kept within the following limits:

Batteries can be charged in:

- **constant voltage mode with load connected**

or

- **constant current or declining current mode when load is isolated.**

High rate or over charge will not damage the battery.

Minimum float charging current: 2 mA per Ah.

- **Constant voltage mode:**

For continuous parallel operation:

- Float voltage: 1.40 - 1.45 V/cell for PT1.2FPL, PT1.2FPM & PT1.2FPH
- Boost Voltage:

PT1.2FPL : 1.60 - 1.70 V/cell
PT1.2FPM : 1.60 - 1.65 V/cell
PT1.2FPH : 1.60 - 1.65 V/cell

A higher voltage will reduce the charge duration and increase the efficiency of recharging but may increase water consumption.

Single stage charging (without boost):

PT1.2FPL : 1.47 - 1.50 V/cell
PT1.2FPM : 1.46 - 1.49 V/cell
PT1.2FPH : 1.45 - 1.48 V/cell

For starting application:

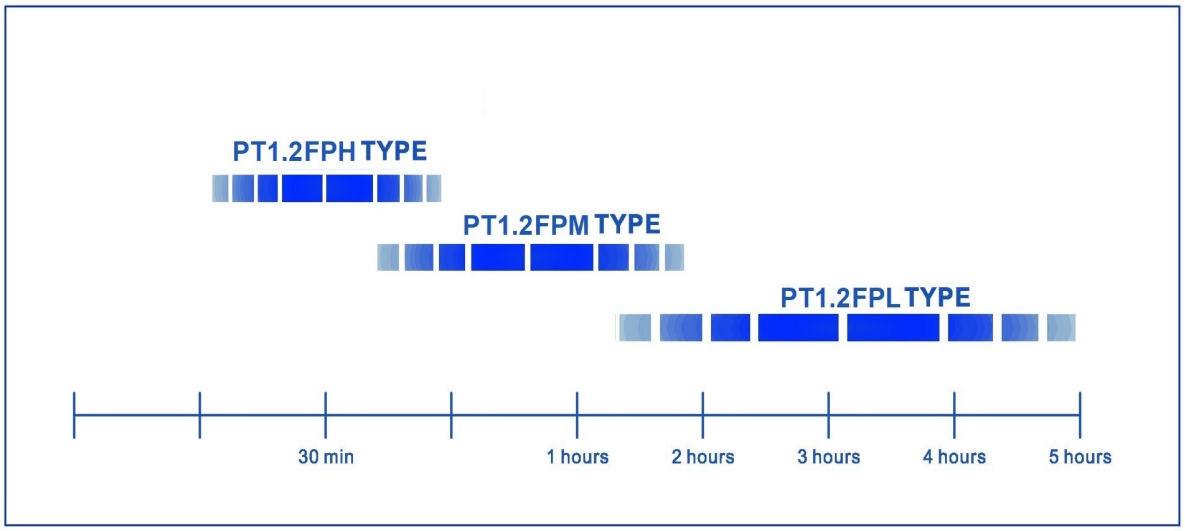
- Recommended charging voltage. 1.50 - 1.55 V/cell.

- **Constant current mode:**

- Normal charging: 0.2 C5 A for 8 hours
- Recommended for quick charging: 0.4 C5 A for 2.5 hours followed by 0.2 C5 A for 2.5 hours

Recommended Type Selection

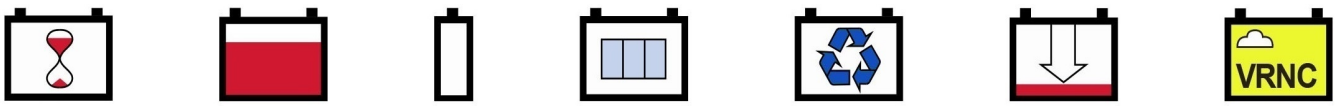
According to backup time required by application:



Initial Charging

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

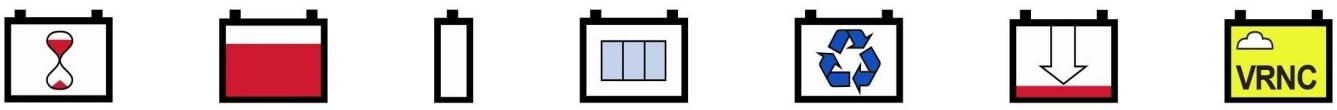
Recommended rates for the first charging: □ 0.2 C5A for 10 hours □ 0.1 C5A for 20 hours



NiCd Pocket Plate PT1.2FPM Range Electrical Specifications & Dimensions

Cell Type	Nominal Voltage (V)	Capacity (C5 Ah)	Dimensions (mm/inch)						Weight (kg/lb.)				Terminal	Cell Case Material
			Length		Width		Height		Without Electrolyte		With Electrolyte			
PT1.2FPM10	1.2	10	43	1.7	85	3.3	260	10.2	0.75	1.7	1.2	2.6	M10	PP
PT1.2FPM20	1.2	20	55	2.2	134	5.3	270	10.6	1.1	2.4	1.9	4.2	M10	PP
PT1.2FPM30	1.2	30	55	2.2	134	5.3	270	10.6	1.6	3.5	2.4	5.3	M10	PP
PT1.2FPM40	1.2	40	60	2.4	140	5.5	270	10.6	2.5	5.5	3.6	7.9	M10	PP
PT1.2FPM50	1.2	50	70	2.8	140	5.5	295	11.6	3	6.6	4.2	9.3	M16	PP
PT1.2FPM60	1.2	60	70	2.8	140	5.5	295	11.6	3.2	7.1	4.4	9.7	M16	PP
PT1.2FPM70	1.2	70	70	2.8	140	5.5	295	11.6	3.4	7.5	4.6	10.1	M16	PP
PT1.2FPM80	1.2	80	80	3.1	140	5.5	365	14.4	4.8	10.6	6.5	14.3	M16	PP
PT1.2FPM90	1.2	90	80	3.1	140	5.5	365	14.4	5.2	11.5	6.7	14.8	M16	PP
PT1.2FPM100	1.2	100	105	4.1	165	6.5	345	13.6	7	15.4	9.2	20.3	M20	PP
PT1.2FPM120	1.2	120	105	4.1	165	6.5	345	13.6	7.2	15.9	9.5	20.9	M20	PP
PT1.2FPM150	1.2	150	165	6.5	167	6.6	345	13.6	9.2	20.3	12.5	27.6	M20	PP
PT1.2FPM200	1.2	200	165	6.5	167	6.6	345	13.6	10.6	23.4	14	30.9	M20	PP
PT1.2FPM250	1.2	250	140	5.5	280	11.0	450	17.7	15.8	34.8	21.5	47.4	2 x M16	PP
PT1.2FPM300	1.2	300	140	5.5	280	11.0	450	17.7	16.5	36.4	22.5	49.6	2 x M16	PP
PT1.2FPM350	1.2	350	170	6.7	285	11.2	350	13.8	16.8	37.0	24	52.9	2 x M20	PP
PT1.2FPM400	1.2	400	175	6.9	285	11.2	500	19.7	23.6	51.9	32	70.4	2 x M20	PP
PT1.2FPM500	1.2	500	175	6.9	285	11.2	500	19.7	27.5	60.6	37	81.4	2 x M20	ABS
PT1.2FPM600	1.2	600	175	6.9	285	11.2	500	19.7	30	66.1	40	88.2	2 x M20	ABS
PT1.2FPM700	1.2	700	186	7.3	398	15.7	565	22.2	41	90.4	55	121	3 x M20	ABS
PT1.2FPM800	1.2	800	186	7.3	398	15.7	565	22.2	43	94.8	58	128	3 x M20	ABS
PT1.2FPM900	1.2	900	186	7.3	398	15.7	565	22.2	46	101	61	134	3 x M20	ABS
PT1.2FPM1000	1.2	1000	186	7.3	398	15.7	565	22.2	48	106	64	141	3 x M20	ABS
PT1.2FPM110	1.2	1100	186	7.3	398	15.7	565	22.2	50	110	66	145	3 x M20	ABS

NILE PT1.2FPM batteries fulfil all requirements specified by IEC publication 60623.
Transparent case optional.



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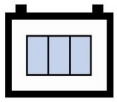
Discharge Data Table

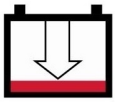
Discharge performance data after fully charged by constant current according to IEC60623

Available amperes at +20°C ±5°C(+68°F ±9°F) Final voltage: 1.14V/cell

Cell Type	Capacity (C5 Ah)	Discharge Time in Hours							Discharge Time in minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
PT1.2FPM10	10	1.07	1.23	1.90	3.16	4.32	5.28	6.90	7.48	9.34	11.0	13.0	14.8	17.5	24.3	27.0	32.8	36.2
PT1.2FPM20	20	1.94	2.40	3.77	6.14	8.46	10.4	12.7	14.5	18.7	22.1	24.0	27.8	33.1	46.6	52.0	60.1	63.0
PT1.2FPM30	30	2.91	3.61	5.66	9.21	12.7	15.6	19.1	21.7	25.5	30.1	32.8	37.9	45.1	63.6	71.0	81.9	85.9
PT1.2FPM40	40	3.88	4.81	7.55	12.3	16.9	20.8	25.4	28.9	34.0	40.1	43.7	50.6	60.2	84.8	94.6	109	115
PT1.2FPM50	50	4.86	6.01	9.44	15.3	21.2	26.0	31.8	36.1	42.5	50.1	54.7	63.2	75.2	106	118	137	143
PT1.2FPM60	60	5.83	7.21	11.3	18.4	25.4	31.2	38.2	43.4	51.0	60.2	65.6	75.8	90.3	127	142	164	172
PT1.2FPM70	70	6.80	8.41	13.2	21.5	29.6	36.3	44.5	50.6	59.5	70.2	76.5	88.5	105	148	166	191	200
PT1.2FPM80	80	7.77	9.61	15.1	24.6	33.8	41.5	50.9	57.8	68.0	80.2	87.4	101	120	170	189	218	229
PT1.2FPM90	90	8.74	10.8	17.0	27.6	38.1	46.7	57.2	65.0	76.4	90.2	98.4	114	135	191	213	246	258
PT1.2FPM100	100	9.71	12.0	18.9	30.7	42.3	51.9	63.6	72.3	84.9	100	109	126	150	212	237	273	286
PT1.2FPM120	120	11.7	14.4	22.6	36.8	50.8	62.3	76.3	86.7	102	120	131	152	181	254	284	328	344
PT1.2FPM150	150	14.6	18.0	28.3	46.0	63.5	77.9	95.4	108	127	150	164	190	226	318	355	410	430
PT1.2FPM200	200	19.4	24.0	37.7	61.4	84.6	104	127	145	170	201	219	253	301	424	473	546	573
PT1.2FPM250	250	24.3	30.0	47.2	76.7	106	130	159	181	212	251	273	316	376	530	591	683	716
PT1.2FPM300	300	29.1	36.1	56.6	92.1	127	156	191	217	255	301	328	379	451	636	710	819	859
PT1.2FPM350	350	34.0	42.1	66.1	107	148	182	223	253	297	351	383	442	527	742	828	956	1002
PT1.2FPM400	400	38.8	48.1	75.5	123	169	208	254	289	340	401	437	506	602	848	946	1092	1145
PT1.2FPM500	500	48.6	60.1	94.4	153	212	260	318	361	425	501	547	632	752	1060	1183	1365	1432
PT1.2FPM600	600	58.3	72.1	113	184	254	312	382	434	510	602	656	758	903	1272	1419	1638	1718
PT1.2FPM700	700	68.0	84.1	132	215	296	363	445	506	595	702	765	885	1053	1483	1656	1911	2004
PT1.2FPM800	800	77.7	96.1	151	246	338	415	509	578	680	802	874	1011	1204	1695	1892	2184	2291
PT1.2FPM900	900	87.4	108	170	276	381	467	572	650	764	902	984	1138	1354	1907	2129	2457	2577
PT1.2FPM1000	1000	97.1	120	189	307	423	519	636	723	849	1003	1093	1264	1505	2119	2365	2730	2864
PT1.2FPM110	1100	107	132	208	338	465	571	700	795	934	1103	1202	1390	1655	2331	2602	3003	3150





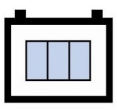

Discharge Data Table

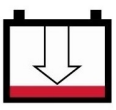
Discharge performance data after fully charged by constant current according to IEC60623

Available amperes at +20°C ±5°C(+68°F ±9°F) Final voltage: 1.10V/cell

Cell Type	Capacity (C5 Ah)	Discharge Time in Hours							Discharge Time in minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
PT1.2FPM10	10	1.10	1.26	1.97	3.30	4.60	5.80	8.00	8.80	10.9	12.9	15.2	17.4	20.5	28.3	31.4	39.1	42.4
PT1.2FPM20	20	2.00	2.48	3.92	6.40	9.00	11.4	14.7	17.0	21.8	25.7	28.2	32.6	38.7	54.3	60.5	71.5	75.9
PT1.2FPM30	30	3.00	3.70	5.88	9.60	13.5	17.1	22.1	25.5	29.7	35.1	38.4	44.4	52.8	74.1	82.5	97.5	104
PT1.2FPM40	40	4.00	4.90	7.84	12.8	18.0	22.8	29.5	34.0	39.6	46.8	51.2	59.2	70.4	98.8	110	130	138
PT1.2FPM50	50	5.00	6.20	9.80	16.0	22.5	28.5	36.9	42.5	49.5	58.5	64.0	74.0	88.0	124	138	163	173
PT1.2FPM60	60	6.00	7.40	11.8	19.2	27.0	34.2	44.2	51.0	59.4	70.2	76.8	88.8	106	148	165	195	207
PT1.2FPM70	70	7.00	8.60	13.7	22.4	31.5	39.9	51.6	59.5	69.3	81.9	89.6	104	123	173	193	228	242
PT1.2FPM80	80	8.00	9.80	15.7	25.6	36.0	45.6	59.0	68.0	79.2	93.6	102	118	141	198	220	260	276
PT1.2FPM90	90	9.00	11.1	17.6	28.8	40.5	51.3	66.3	76.5	89.1	105	115	133	158	222	248	293	311
PT1.2FPM100	100	10.0	12.3	19.6	32.0	45.0	57.0	73.7	85.0	99.0	117	128	148	176	247	275	325	345
PT1.2FPM120	120	12.0	14.8	23.5	38.4	54.0	68.4	88.4	102	119	140	154	178	211	296	330	390	414
PT1.2FPM150	150	15.0	18.5	29.4	48.0	67.5	85.5	111	128	149	176	192	222	264	371	413	488	518
PT1.2FPM200	200	20.0	24.6	39.2	64.0	90.0	114	147	170	198	234	256	296	352	494	550	650	690
PT1.2FPM250	250	25.0	30.8	49.0	80.0	113	143	184	213	248	293	320	370	440	618	688	813	863
PT1.2FPM300	300	30.0	36.9	58.8	96.0	135	171	221	255	297	351	384	444	528	741	825	975	1035
PT1.2FPM350	350	35.0	43.1	68.6	112	158	200	258	298	347	410	448	518	616	865	963	1138	1208
PT1.2FPM400	400	40.0	49.2	78.4	128	180	228	295	340	396	468	512	592	704	988	1100	1300	1380
PT1.2FPM500	500	50.0	61.5	98.0	160	225	285	369	425	495	585	640	740	880	1235	1375	1625	1725
PT1.2FPM600	600	60.0	73.8	118	192	270	342	442	510	594	702	768	888	1056	1482	1650	1950	2070
PT1.2FPM700	700	70.0	86.1	137	224	315	399	516	595	693	819	896	1036	1232	1729	1925	2275	2415
PT1.2FPM800	800	80.0	98.4	157	256	360	456	590	680	792	936	1024	1184	1408	1976	2200	2600	2760
PT1.2FPM900	900	90.0	111	176	288	405	513	663	765	891	1053	1152	1332	1584	2223	2475	2925	3105
PT1.2FPM1000	1000	100	123	196	320	450	570	737	850	990	1170	1280	1480	1760	2470	2750	3250	3450
PT1.2FPM110	1100	110	135	216	352	495	627	811	935	1089	1287	1408	1628	1936	2717	3025	3575	3795



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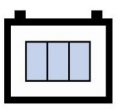
Discharge Data Table

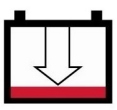
Discharge performance data after fully charged by constant current according to IEC60623

Available amperes at +20°C ±5°C(+68°F ±9°F) Final voltage: 1.05V/cell

Cell Type	Capacity (C5 Ah)	Discharge Time in Hours							Discharge Time in minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
PT1.2FPM10	10	1.13	1.30	2.00	3.40	4.82	6.38	9.36	10.6	13.5	16.3	18.2	20.3	24.0	33.0	36.9	45.9	50.8
PT1.2FPM20	20	2.06	2.57	3.98	6.59	9.43	12.5	17.2	20.4	27.0	32.7	33.8	38.1	45.5	63.5	71.3	84.1	91.1
PT1.2FPM30	30	3.09	3.79	5.97	9.89	14.1	18.8	25.9	30.6	36.8	44.6	46.1	51.9	62.0	86.5	97.2	115	124
PT1.2FPM40	40	4.12	5.06	7.96	13.2	18.9	25.1	34.5	40.8	49.1	59.4	61.4	69.3	82.7	115	130	153	166
PT1.2FPM50	50	5.15	6.32	9.95	16.5	23.6	31.4	43.1	51.0	61.4	74.3	76.8	86.6	103	144	162	191	207
PT1.2FPM60	60	6.18	7.59	11.9	19.8	28.3	37.6	51.7	61.2	73.7	89.2	92.2	104	124	173	194	229	248
PT1.2FPM70	70	7.21	8.85	13.9	23.1	33.0	43.9	60.4	71.4	85.9	104	108	121	145	202	227	268	290
PT1.2FPM80	80	8.24	10.1	15.9	26.4	37.7	50.2	69.0	81.6	98.2	119	123	139	165	231	259	306	331
PT1.2FPM90	90	9.27	11.4	17.9	29.7	42.4	56.4	77.6	91.8	110	134	138	156	186	260	292	344	373
PT1.2FPM100	100	10.3	12.6	19.9	33.0	47.2	62.7	86.2	102	123	149	154	173	207	288	324	382	414
PT1.2FPM120	120	12.4	15.2	23.9	39.6	56.6	75.2	103	122	147	178	184	208	248	346	389	459	497
PT1.2FPM150	150	15.5	19.0	29.8	49.4	70.7	94.1	129	153	184	223	230	260	310	433	486	573	621
PT1.2FPM200	200	20.6	25.3	39.8	65.9	94.3	125	172	204	246	297	307	346	414	577	648	764	828
PT1.2FPM250	250	25.8	31.6	49.7	82.4	118	157	216	255	307	371	384	433	517	721	810	956	1035
PT1.2FPM300	300	30.9	37.9	59.7	98.9	141	188	259	306	368	446	461	519	620	865	972	1147	1242
PT1.2FPM350	350	36.1	44.3	69.6	115	165	219	302	357	430	520	538	606	724	1010	1134	1338	1449
PT1.2FPM400	400	41.2	50.6	79.6	132	189	251	345	408	491	594	614	693	827	1154	1296	1529	1656
PT1.2FPM500	500	51.5	63.2	99.5	165	236	314	431	510	614	743	768	866	1034	1442	1620	1911	2070
PT1.2FPM600	600	61.8	75.9	119	198	283	376	517	612	737	892	922	1039	1241	1731	1944	2293	2484
PT1.2FPM700	700	72.1	88.5	139	231	330	439	604	714	859	1040	1075	1212	1448	2019	2268	2675	2898
PT1.2FPM800	800	82.4	101	159	264	377	502	690	816	982	1189	1229	1385	1654	2308	2592	3058	3312
PT1.2FPM900	900	92.7	114	179	297	424	564	776	918	1105	1337	1382	1558	1861	2596	2916	3440	3726
PT1.2FPM1000	1000	103	126	199	330	472	627	862	1020	1228	1486	1536	1732	2068	2885	3240	3822	4140
PT1.2FPM110	1100	113	139	219	363	519	690	949	1122	1350	1634	1690	1905	2275	3173	3563	4204	4554






Calculation Methods

Information required for battery capacity calculation

The following information needed for a precise battery capacity calculation:

- Nominal voltage of the system
- Load current required
- Backup time required
- Maximum voltage (for charging)
- Minimum voltage
- Temperature range
- Battery layout and available space
- Physical condition

Float Voltage Operation

In these conditions the float voltage, being the voltage at which the general load circuit will operate, then a decision will have to be reached on the cell float voltage needed to maintain the battery 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 voltage per cell, but the exact figure has to be related carefully to circumstances.

For Example

A NILE Nickel Cadmium battery is required to maintain an inverter load of 50KVA at 0.8 power factor for a backup time of 30 minutes, at 20~25°C temperature. The DC voltage to the inverter operates within the limit of 265 volts with the battery on float charge to a minimum of 202 volts at end of back up time. The inverter has an 85% efficiency rate.

-Number of Cells (at recommended float of 1.44VPC) = 265/1.44≈184cells

-Minimum Cell Voltage = 202/184≈1.10 volts per cell

-Maximum Battery Current

$$= \frac{\text{Inverter load in KVA x Power factor}}{\text{Min. cell voltage x Number of cells x Inverter efficiency}}$$

$$= \frac{50\text{KVA} \times 0.80}{1.10 \times 184 \times 0.85} = 232.5 \text{ Amps}$$

We shall choose the battery with capacity equal or just above 232.5Amps.

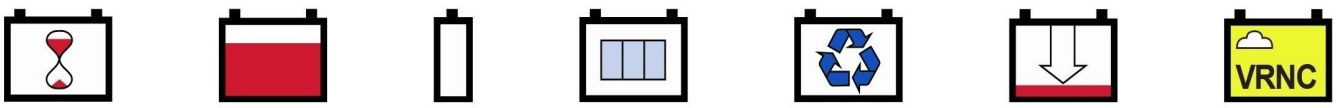
To meet the 30 minutes backup time requirement, we determine to choose the battery size from PT1.2FPM Range.

From our catalogue data, the cell type is PT1.2FPM300.

Battery shall comprise 184 cells of NILE Nickel Cadmium type PT1.2FPM300.

System Voltage	Number of Cells	Spread Range Number of Cells
24	20	18 ~ 21
36	30	27 ~ 31
48	40	36 ~ 41
110	92	88 ~ 93
220	184	180 ~ 186

The number of cells in a battery may be determined by simply dividing the nominal voltage of the system by the nominal voltage of a cell (1.2 Volts).



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