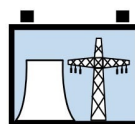
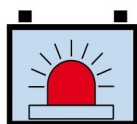
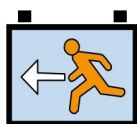
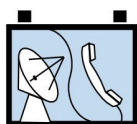


Guarantee

NiCd Pocket Plate Range PT1.2FPL10-1200Ah



*»Premium quality for
uninterrupted communication«*





NiCd Pocket Plate Range
PT1.2FPL 10-1200Ah

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 -20°C to +60°C (-4°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.

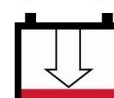
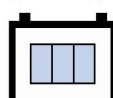
Good reserves and circulation of the electrolyte are achieved by a wide inter-plate space.

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.



Protective cover

- To prevent external short-circuits
- In line with EN 50272-2 (safety) with ip2 level

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

Horizontal pockets of double-perforated steel strips.

Cell container

Material: translucent/transparent polypropylene

Flame-arresting vents

Material: polypropylene.

Plate tab

Spot-welded both to the plate side-frames and to the upper edge of the pocket plate.

Separating grids

- These separate the plates and insulate the plate frames from each other.
- The grids allow free circulation of electrolyte between the plates.

Plate frame

Seals the plate pockets and serves as a current collector.

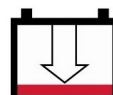
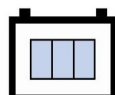
Application

PT1.2FPL Series nickel cadmium batteries are designed for general industrial applications where absolute reliability is a necessity. Service-proven pocket-plate technology ensures long uninterrupted battery life without the risk of sudden loss of power.

PT1.2FPL Series batteries are suitable for low discharge rate applications (between 1 hour to 100 hours) such as railroad signaling and control systems, photovoltaic, emergency lighting, telecommunications, etc.

Performance Data

- ☐ Proven pocket-plate nickel-cadmium technology 50 years of experience in developing and manufacturing nickel-cadmium batteries.
- ☐ High tolerance to electrical abuses such as overcharge and over discharge.
- ☐ High tolerance to rough handling and mechanical abuse due to strong components and robust construction.
- ☐ Trouble-free long cycle life .
- ☐ No risk of sudden death due to the chemistry and the cell structure.
- ☐ Wide operating temperature: -40°C to 60°C.
- ☐ Generous electrolyte reserve for long maintenance intervals.
- ☐ Clear (MBS) or translucent (PP) plastic cell case for easy electrolyte level inspection.
- ☐ Plastic grid spacers eliminate separator deterioration problem.
- ☐ Custom cell dimensions available.
- ☐ 20 years service life in stationary applications.
- ☐ Conforms to IEC60623.



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:

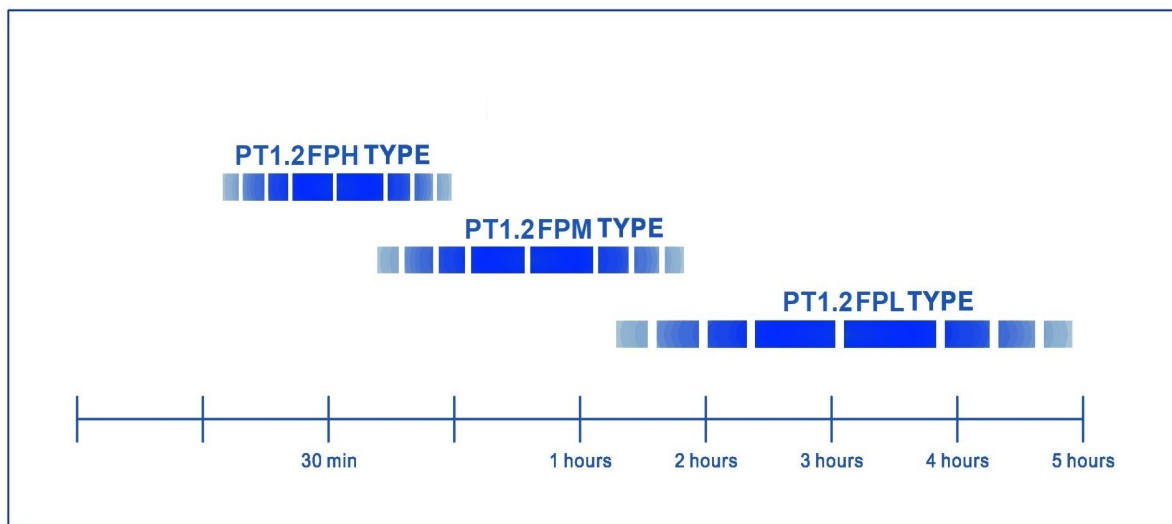
- Recommended charging voltage. 1.50 - 1.55 V/cell.

- ◆ **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

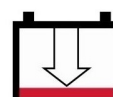
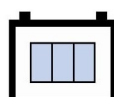
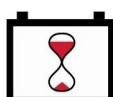
According to backup time required by application:



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

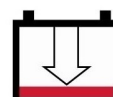
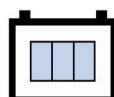


NiCd Pocket Plate PT1.2FPL Range Electrical Specifications & Dimensions

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			
PT1.2 FPL10	1.2	10	40	1.6	85	3.3	150	5.9	0.7	1.5	1.0	2.2	M8	PP
PT1.2 FPL20	1.2	20	55	2.2	134	5.3	270	10.6	1.1	2.4	1.8	4.0	M10	PP
PT1.2 FPL30	1.2	30	55	2.2	134	5.3	270	10.6	1.5	3.3	2.2	4.8	M10	PP
PT1.2 FPL40	1.2	40	55	2.2	134	5.3	270	10.6	1.8	4.0	2.6	5.7	M10	PP
PT1.2 FPL50	1.2	50	60	2.4	140	5.5	270	10.6	2.4	5.3	3.2	7.1	M10	PP
PT1.2 FPL60	1.2	60	60	2.4	140	5.5	270	10.6	2.8	6.2	3.8	8.4	M10	PP
PT1.2 FPL70	1.2	70	70	2.8	141	5.6	295	11.6	2.9	6.4	4.1	9.0	M10	PP
PT1.2 FPL80	1.2	80	70	2.8	141	5.6	295	11.6	3.4	7.5	4.6	10.1	M10	PP
PT1.2 FPL90	1.2	90	80	3.1	140	5.5	365	14.4	4.2	9.3	6.0	13.2	M10	PP
PT1.2 FPL100	1.2	100	80	3.1	140	5.5	365	14.4	4.5	9.9	6.2	13.7	M10	PP
PT1.2 FPL120	1.2	120	80	3.1	140	5.5	365	14.4	5.0	11.0	6.5	14.3	M10	PP
PT1.2 FPL150	1.2	150	105	4.1	165	6.5	345	13.6	6.9	15.2	9.5	20.9	M20	PP
PT1.2 FPL200	1.2	200	105	4.1	165	6.5	345	13.6	7.8	17.2	10.0	22.0	M20	PP
PT1.2 FPL250	1.2	250	165	6.5	167	6.6	345	13.6	10.2	22.5	14.2	31.3	M20	PP
PT1.2 FPL300	1.2	300	140	5.5	280	11.0	450	17.7	13.8	30.4	21.0	46.3	2 x M16	PP
PT1.2 FPL350	1.2	350	140	5.5	280	11.0	450	17.7	15.0	33.1	22.0	48.5	2 x M16	PP
PT1.2 FPL400	1.2	400	140	5.5	280	11.0	450	17.7	15.8	34.8	22.8	50.3	2 x M16	PP
PT1.2 FPL500	1.2	500	140	5.5	280	11.0	490	19.3	16.8	37.0	24.0	52.9	2 x M20	PP
PT1.2 FPL600	1.2	600	175	6.9	290	11.4	500	19.7	27.0	59.5	37.0	81.5	2 x M20	ABS
PT1.2 FPL700	1.2	700	175	6.9	290	11.4	500	19.7	29.0	63.9	39.0	86.0	2 x M20	ABS
PT1.2 FPL800	1.2	800	186	7.3	398	15.7	565	22.2	39.0	86.0	58.0	128	3 x M20	ABS
PT1.2 FPL900	1.2	900	186	7.3	398	15.7	565	22.2	41.0	90.4	60.0	132	3 x M20	ABS
PT1.2 FPL1000	1.2	1000	186	7.3	398	15.7	565	22.2	44.0	97.0	61.0	134	3 x M20	ABS
PT1.2 FPL1100	1.2	1100	186	7.3	398	15.7	565	22.2	45.0	99.2	62.0	137	3 x M20	ABS
PT1.2 FPL1200	1.2	1200	186	7.3	398	15.7	565	22.2	46.0	101	63.0	139	3 x M20	ABS

NiLE PT1.2FPL batteries fulfill all requirements specified by IEC publication 60623.

Transparent case optional.



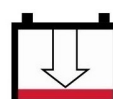
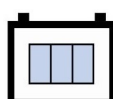
Discharge Data Table

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: 1.14 V/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
PT1.2 FPL10	10	1.00	1.23	1.91	2.99	3.86	4.42	5.10	5.61	6.53	7.56	8.19	9.14	11.0	14.6	15.5	18.2	18.8
PT1.2 FPL20	20	1.98	2.42	3.64	5.45	7.14	8.30	10.2	11.2	13.1	15.1	16.7	17.6	20.2	29.0	33.5	44.0	50.3
PT1.2 FPL30	30	2.97	3.64	5.45	8.18	10.7	12.4	15.3	16.8	19.6	22.7	25.1	26.5	30.2	43.4	50.3	65.8	75.4
PT1.2 FPL40	40	3.96	4.85	7.27	10.9	14.3	16.6	20.4	22.4	26.1	30.2	33.4	35.3	40.3	57.9	67.0	87.8	101
PT1.2 FPL50	50	4.95	6.06	9.09	13.6	17.9	20.7	25.5	28.1	32.7	37.8	41.8	44.1	50.4	72.3	83.8	110	126
PT1.2 FPL60	60	5.94	7.27	10.9	16.3	21.4	24.9	30.6	33.7	39.2	45.3	47.6	54.6	58.8	81.1	89.8	115	130
PT1.2 FPL70	70	6.79	8.30	12.6	18.7	24.3	28.1	32.8	36.1	41.4	48.5	50.0	57.3	61.7	85.2	94.3	121	136
PT1.2 FPL80	80	7.92	9.70	14.5	21.0	26.5	30.5	35.9	39.5	45.7	50.4	53.8	60.5	70.6	91.1	100	124	137
PT1.2 FPL90	90	8.91	10.9	16.4	23.6	29.9	34.3	40.4	44.4	51.4	56.7	60.5	68.0	79.4	102	112	139	154
PT1.2 FPL100	100	9.73	11.8	18.0	26.6	34.7	40.2	46.9	51.6	59.2	69.3	71.4	81.9	88.2	121	135	173	195
PT1.2 FPL120	120	11.9	14.5	21.8	31.5	39.8	45.7	53.9	59.2	68.5	75.6	80.6	90.9	106	137	149	185	206
PT1.2 FPL150	150	14.8	18.2	27.3	39.4	49.7	57.2	67.3	74.1	85.7	94.5	101	114	133	171	187	232	258
PT1.2 FPL200	200	19.8	24.2	36.4	52.5	66.3	76.2	89.8	98.7	115	126	134	151	176	227	250	309	343
PT1.2 FPL250	250	24.8	30.3	45.5	65.7	82.9	95.5	112	123	143	158	168	189	221	284	312	387	429
PT1.2 FPL300	300	29.7	36.4	54.5	78.8	100	114	135	148	171	189	202	227	265	341	374	464	515
PT1.2 FPL350	350	34.7	42.4	63.6	92.0	116	133	157	173	200	221	236	265	309	398	437	541	600
PT1.2 FPL400	400	39.6	48.5	72.7	105	133	152	180	198	228	252	269	303	353	454	499	618	686
PT1.2 FPL500	500	49.5	60.6	90.9	132	166	191	224	246	286	315	336	378	441	568	623	773	858
PT1.2 FPL600	600	59.4	72.7	109	158	199	228	269	296	343	378	403	454	529	683	749	928	1029
PT1.2 FPL700	700	69.3	84.8	127	184	232	267	314	346	400	441	470	529	617	796	873	1082	1201
PT1.2 FPL800	800	79.1	97.0	145	210	265	305	359	395	457	504	537	605	705	910	998	1237	1372
PT1.2 FPL900	900	89.1	109	164	237	299	342	404	444	514	567	605	680	794	1024	1122	1391	1544
PT1.2 FPL1000	1000	99.0	121	182	262	332	381	449	494	571	630	672	756	882	1138	1247	1546	1716
PT1.2 FPL1100	1100	109	133	200	289	365	419	494	543	628	693	739	832	970	1251	1371	1701	1887
PT1.2 FPL1200	1200	119	145	218	315	398	457	539	592	685	756	806	907	1058	1365	1496	1855	2059



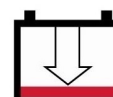
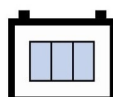
Discharge Data Table

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: 1.10 V/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
PT1.2 FPL10	10	1.01	1.25	1.97	3.11	4.26	4.98	5.86	6.33	7.55	8.57	9.29	10.3	12.1	16.2	17.7	19.7	20.3
PT1.2 FPL20	20	2.02	2.50	3.87	5.92	7.98	9.55	11.8	12.7	15.5	17.4	18.7	21.4	25.7	32.9	37.8	49.4	56.2
PT1.2 FPL30	30	3.03	3.75	5.82	8.89	12.0	14.3	17.6	19.0	23.3	26.2	28.2	32.1	42.6	49.5	56.7	74.2	84.4
PT1.2 FPL40	40	4.04	5.00	7.76	11.8	16.0	19.1	23.4	25.3	31.0	34.9	37.5	42.8	51.4	65.9	75.6	98.8	112
PT1.2 FPL50	50	5.05	6.25	9.7	14.8	20.0	23.9	29.3	31.7	38.7	43.6	46.9	53.6	64.2	82.4	94.5	124	140
PT1.2 FPL60	60	6.06	7.50	11.6	17.8	23.9	28.6	35.2	38.0	46.5	52.3	56.3	64.3	70.1	90.7	104	134	149
PT1.2 FPL70	70	7.00	8.66	13.5	20.7	27.6	32.5	39.6	42.8	50.0	55.7	57.1	64.3	77.1	97.1	109	136	152
PT1.2 FPL80	80	8.08	10.0	15.5	23.1	30.7	35.6	43.6	47.1	53.9	58.8	65.3	73.4	78.3	104	113	138	151
PT1.2 FPL90	90	9.09	11.3	17.4	26.0	34.5	40.0	49.1	53.0	60.6	66.1	73.4	82.6	88.1	117	128	156	170
PT1.2 FPL100	100	10.0	12.4	19.2	29.7	39.4	46.5	56.6	61.1	71.4	79.6	81.6	91.8	110	138	155	194	218
PT1.2 FPL120	120	12.0	14.9	23.0	35.6	47.3	55.8	67.9	73.3	85.7	95.5	97.9	110	132	166	186	233	261
PT1.2 FPL150	150	15.2	18.7	29.1	43.4	57.6	66.7	81.8	88.4	101	110	122	138	146	195	212	259	283
PT1.2 FPL200	200	20.2	25.0	38.8	57.9	76.8	88.9	109	118	135	147	163	184	196	260	283	345	378
PT1.2 FPL250	250	25.3	31.2	48.5	72.4	96.4	111	137	148	169	184	204	230	245	325	353	431	472
PT1.2 FPL300	300	30.3	37.5	58.2	86.9	116	133	164	177	202	220	245	276	294	390	425	518	567
PT1.2 FPL350	350	35.4	43.7	67.9	102	135	156	191	207	236	257	286	322	343	454	495	604	662
PT1.2 FPL400	400	40.4	50.0	77.6	116	154	178	218	236	269	294	326	368	391	519	566	690	756
PT1.2 FPL500	500	50.5	62.5	96.9	145	192	222	272	294	337	367	408	459	490	649	707	862	945
PT1.2 FPL600	600	60.6	75.0	116	174	230	267	327	353	404	441	490	551	588	779	849	1035	1134
PT1.2 FPL700	700	70.7	87.5	135	203	269	311	382	412	471	514	571	643	685	909	990	1208	1323
PT1.2 FPL800	800	80.8	100	155	232	307	355	436	471	539	588	653	734	784	1039	1132	1380	1512
PT1.2 FPL900	900	90.9	112	175	260	346	400	491	531	606	661	734	827	881	1169	1273	1552	1701
PT1.2 FPL1000	1000	101	125	194	289	384	445	546	589	673	734	816	918	979	1298	1415	1725	1890
PT1.2 FPL1100	1100	111	137	213	318	422	489	600	648	741	808	898	1010	1077	1428	1557	1897	2079
PT1.2 FPL1200	1200	121	150	232	347	461	533	654	707	808	881	979	1102	1175	1559	1697	2070	2267



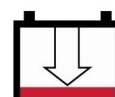
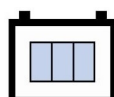
Discharge Data Table

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: 1.05 V/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
PT1.2 FPL10	10	1.04	1.28	2.01	3.21	4.6	5.63	6.84	7.66	8.77	10.0	10.9	12.2	14.4	19.1	20.6	24.2	25.1
PT1.2 FPL20	20	2.06	2.55	3.96	6.26	8.8	10.8	14.0	15.7	18.7	22.3	24.3	27.2	29.7	40.1	45.0	59.9	67.4
PT1.2 FPL30	30	3.09	3.83	5.94	9.39	13.3	16.1	21.0	23.5	28.2	33.4	36.5	40.8	44.5	60.2	67.6	89.8	101
PT1.2 FPL40	40	4.12	5.10	7.92	12.5	17.6	21.5	27.9	31.3	37.5	44.5	48.6	54.4	59.3	80.2	90.0	120	134
PT1.2 FPL50	50	5.15	6.37	9.90	15.7	22.0	26.9	34.9	39.1	46.9	55.7	60.8	67.9	74.2	100	113	150	169
PT1.2 FPL60	60	6.18	7.65	11.9	18.8	26.5	32.3	42.0	47.0	56.3	66.8	73.0	81.5	89.0	121	135	180	202
PT1.2 FPL70	70	7.07	8.84	13.9	22.2	30.7	37.1	45.7	51.2	60.0	69.2	75.0	82.2	95.2	118	130	168	185
PT1.2 FPL80	80	8.08	10.1	15.8	25.3	35.1	42.4	52.2	58.5	68.5	79.1	85.7	93.9	109	135	148	192	212
PT1.2 FPL90	90	9.27	11.6	18.0	28.2	39.0	46.5	57.9	64.8	75.3	84.8	89.0	101	122	141	154	189	205
PT1.2 FPL100	100	10.3	12.9	20.0	31.4	43.4	51.6	64.3	72.0	83.6	94.2	98.9	112	136	156	171	210	228
PT1.2 FPL120	120	12.1	15.2	23.8	38.0	52.6	63.6	78.3	87.7	103	119	128	140	163	202	224	288	317
PT1.2 FPL150	150	15.5	19.3	30.0	47.0	65.0	77.5	96.4	108.0	126	141	148	167	204	235	257	314	341
PT1.2 FPL200	200	20.6	25.6	40.0	62.6	86.7	104	129	144.0	168	188	198	222	272	313	342	419	455
PT1.2 FPL250	250	25.8	32.0	50.0	78.3	108	129	160	179.7	210	236	247	278	340	391	428	524	569
PT1.2 FPL300	300	31.0	38.4	60.0	94.2	130	155	193	216.2	251	282	297	334	408	470	513	628	682
PT1.2 FPL350	350	36.1	44.9	70.0	109	151	181	225	251.6	293	330	346	389	476	548	599	733	796
PT1.2 FPL400	400	41.2	51.3	80.0	126	173	206	257	287.4	334	377	395	445	544	626	685	838	910
PT1.2 FPL500	500	51.5	64.1	100	156	217	258	321	359.5	418	472	495	556	680	783	856	1047	1138
PT1.2 FPL600	600	61.8	76.9	120	188	260	310	386	431.8	502	565	593	667	816	939	1028	1257	1365
PT1.2 FPL700	700	72.1	89.7	140	219	304	362	450	503.8	585	660	692	779	952	1096	1199	1467	1592
PT1.2 FPL800	800	82.5	102	160	250	347	414	514	575.9	670	754	791	890	1088	1253	1370	1676	1820
PT1.2 FPL900	900	92.8	115	180	282	390	465	579	648.0	753	848	890	1001	1224	1409	1541	1885	2047
PT1.2 FPL1000	1000	103	128	200	313	434	517	643	720.2	836	942	989	1113	1359	1565	1713	2095	2274
PT1.2 FPL1100	1100	113	141	220	344	477	568	707	791.7	920	1037	1088	1224	1496	1722	1884	2305	2502
PT1.2 FPL1200	1200	123	154	240	376	520	620	771	863.7	1004	1131	1187	1335	1632	1879	2055	2514	2729



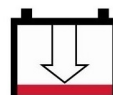
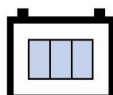
Discharge Data Table

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: 1.00 V/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
PT1.2 FPL10	10	1.04	1.28	2.02	3.26	4.67	5.90	7.64	8.56	9.90	11.3	12.2	13.7	16.3	21.6	23.8	27.6	28.1
PT1.2 FPL20	20	2.08	2.58	4.04	6.46	9.2	11.6	15.5	17.3	22.1	25.4	27.7	30.8	37.1	46.0	51.7	67.9	76.4
PT1.2 FPL30	30	3.11	3.87	6.06	9.70	13.8	17.4	23.3	26.0	33.0	38.1	41.6	34.0	55.6	69.0	77.5	102	114
PT1.2 FPL40	40	4.14	5.15	8.08	12.9	18.4	23.1	31.0	34.7	44.1	50.8	55.5	46.4	76.2	92.0	103	135	153
PT1.2 FPL50	50	5.18	6.44	10.1	16.1	23.0	28.9	38.7	43.4	55.1	63.5	69.3	65.7	92.7	115	129	170	191
PT1.2 FPL60	60	6.22	7.73	12.1	19.4	27.6	34.7	46.5	52.1	66.1	76.2	83.2	70.3	112	138	155	203	230
PT1.2 FPL70	70	7.15	8.93	14.1	22.6	32.5	40.1	52.2	58.4	70.7	81.4	87.1	89.4	109	136	147	191	213
PT1.2 FPL80	80	8.33	10.3	16.2	25.9	36.4	44.7	58.0	64.9	79.2	90.2	97.9	85.9	119	144	157	192	206
PT1.2 FPL90	90	9.37	11.6	18.2	29.1	41.0	50.3	65.2	73.1	89.1	101	110	122	134	162	177	216	232
PT1.2 FPL100	100	10.4	12.9	20.2	32.3	45.5	55.9	72.5	81.2	99.0	113	122	136	149	180	196	240	258
PT1.2 FPL120	120	12.2	15.3	24.2	38.8	55.8	68.6	89.4	100	121	139	149	140	185	233	253	328	364
PT1.2 FPL150	150	15.6	19.4	30.3	48.5	68.2	83.9	109	122	149	169	184	160	223	270	294	359	386
PT1.2 FPL200	200	20.9	25.8	40.4	64.6	91.0	111	144	162	197	226	245	206	296	360	392	479	514
PT1.2 FPL250	250	26.0	32.2	50.5	80.8	114	139	181	202	247	283	306	273	371	450	489	598	644
PT1.2 FPL300	300	31.2	38.6	60.6	97.0	136	168	217	244	297	340	367	289	445	540	588	718	772
PT1.2 FPL350	350	36.4	45.1	70.7	113	159	196	253	284	347	396	428	412	519	631	685	838	901
PT1.2 FPL400	400	41.6	51.5	80.8	129	182	224	290	325	396	453	490	491	594	720	783	957	1029
PT1.2 FPL500	500	52.0	64.4	101	161	228	279	362	405	495	566	612	553	741	900	979	1197	1287
PT1.2 FPL600	600	62.4	77.3	121	194	273	335	435	487	594	679	734	693	890	1080	1174	1436	1545
PT1.2 FPL700	700	72.8	90.2	141	226	318	391	507	568	693	793	857	816	1038	1261	1370	1676	1802
PT1.2 FPL800	800	83.2	103	162	259	364	447	579	649	791	905	979	917	1186	1441	1566	1915	2059
PT1.2 FPL900	900	93.7	116	182	291	409	503	652	730	890	1019	1102	1098	1335	1620	1762	2155	2316
PT1.2 FPL1000	1000	104	129	202	323	455	558	724	811	989	1132	1224	1233	1483	1800	1957	2394	2574
PT1.2 FPL1100	1100	114	141	222	356	500	615	797	892	1088	1245	1346	1386	1632	1981	2153	2633	2831
PT1.2 FPL1200	1200	125	155	242	388	545	671	869	973	1187	1359	1469	1496	1780	2161	2348	2873	3088



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.

$$\text{Number of cells required} = \frac{\text{Circuit voltage}}{\text{Cell Float voltage}} \quad \text{Minimum cell voltage} = \frac{\text{Minimum D.C. voltage}}{\text{Number of cells}}$$

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 up 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) = $265/1.44 \approx 184$ cells

-Minimum Cell Voltage = $202/184 \approx 1.10$ volts per cell

-Maximum Battery Current

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

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

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

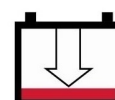
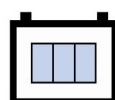
To meet the 30 minutes backup time requirement, we determine to choose the battery size from PT1.2FPL Range.

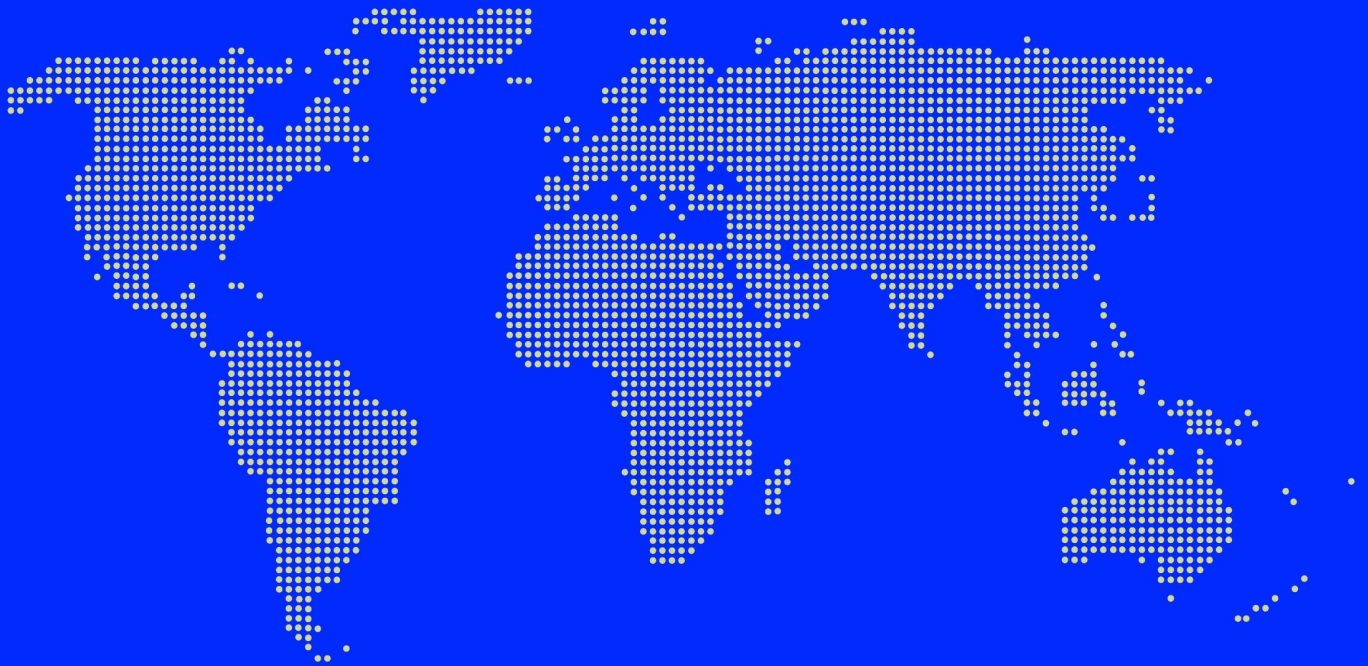
From our catalogue data, the cell type is PT1.2FPL300.

Battery shall comprise 184 cells of NILE Nickel Cadmium type PT1.2FPL300.

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).



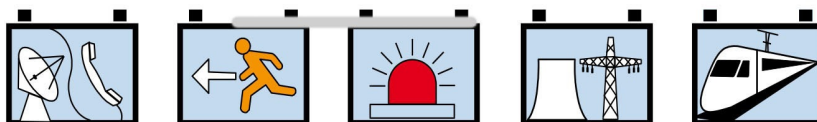


Guarantee

NiCd Pocket Plate Range PT1.2FPM10-1100



»Premium quality for
uninterrupted communication«





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 $+60^{\circ}\text{C}$ (-40°F to $+140^{\circ}\text{F}$), they can tolerate extremes of -50°C to $+70^{\circ}\text{C}$ (-58°F to $+158^{\circ}\text{F}$) 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.

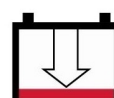
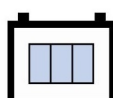
Good reserves and circulation of the electrolyte are achieved by a wide inter-plate space.

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



Protective cover

- To prevent external short-circuits
- In line with EN 50272-2 (safety) with ip2 level

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

Horizontal pockets of double-perforated steel strips.

Cell container

Material: translucent/transparent polypropylene

Flame-arresting vents

Material: polypropylene.

Plate tab

Spot-welded both to the plate side-frames and to the upper edge of the pocket plate.

Separating grids

- These separate the plates and insulate the plate frames from each other.
- The grids allow free circulation of electrolyte between the plates.

Plate frame

Seals the plate pockets and serves as a current collector.

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

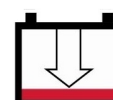
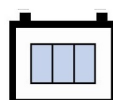
Many nickel-cadmium batteries are used in stationary standby power applications where discharges occur infrequently and the battery is continuously charged by a float or constant potential charge.

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:

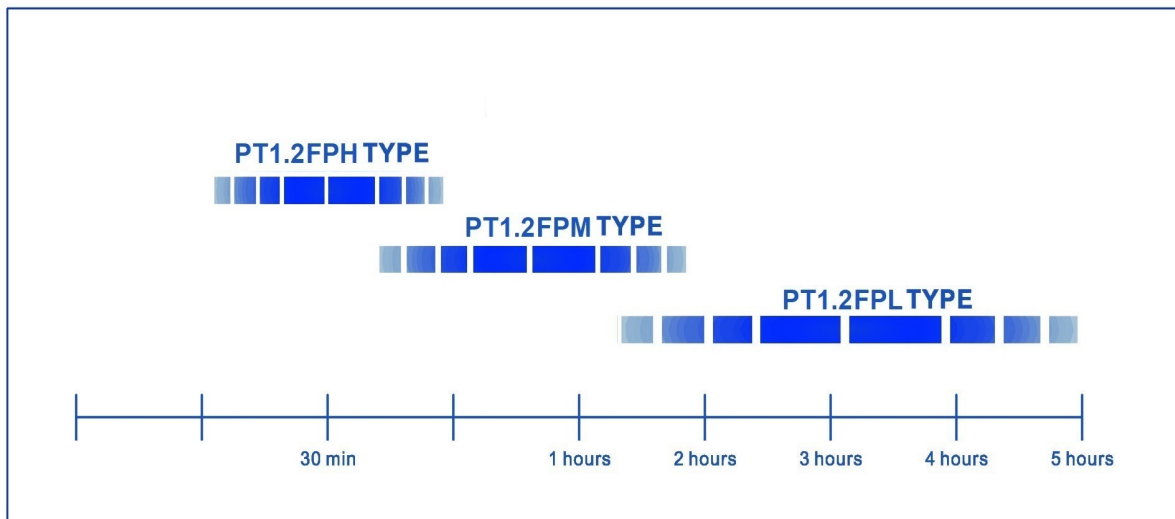
- Recommended charging voltage. 1.50 - 1.55 V/cell.

- ◆ **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

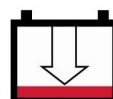
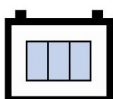
According to backup time required by application:



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.

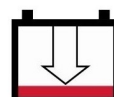
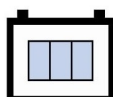
Recommended rates for the first charging: □ 0.2 C5A for 10 hours □ 0.1 C5A for 20 hours



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.



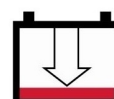
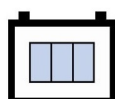
Discharge Data Table

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
PT1.2FPM1100	1100	107	132	208	338	465	571	700	795	934	1103	1202	1390	1655	2331	2602	3003	3150



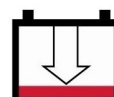
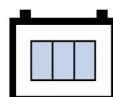
Discharge Data Table

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



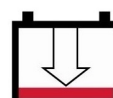
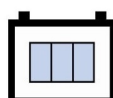
Discharge Data Table

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
PT1.2FPM1100	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.

$$\text{Number of cells required} = \frac{\text{Circuit voltage}}{\text{Cell Float voltage}} \quad \text{Minimum cell voltage} = \frac{\text{Minimum D.C. voltage}}{\text{Number of cells}}$$

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) = $265/1.44 \approx 184$ cells

-Minimum Cell Voltage = $202/184 \approx 1.10$ volts per cell

-Maximum Battery Current

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

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

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

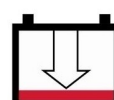
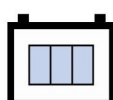
To meet the 30 minutes backup time requirement, we determine to choose the battery size from PT1.2FPM Range.

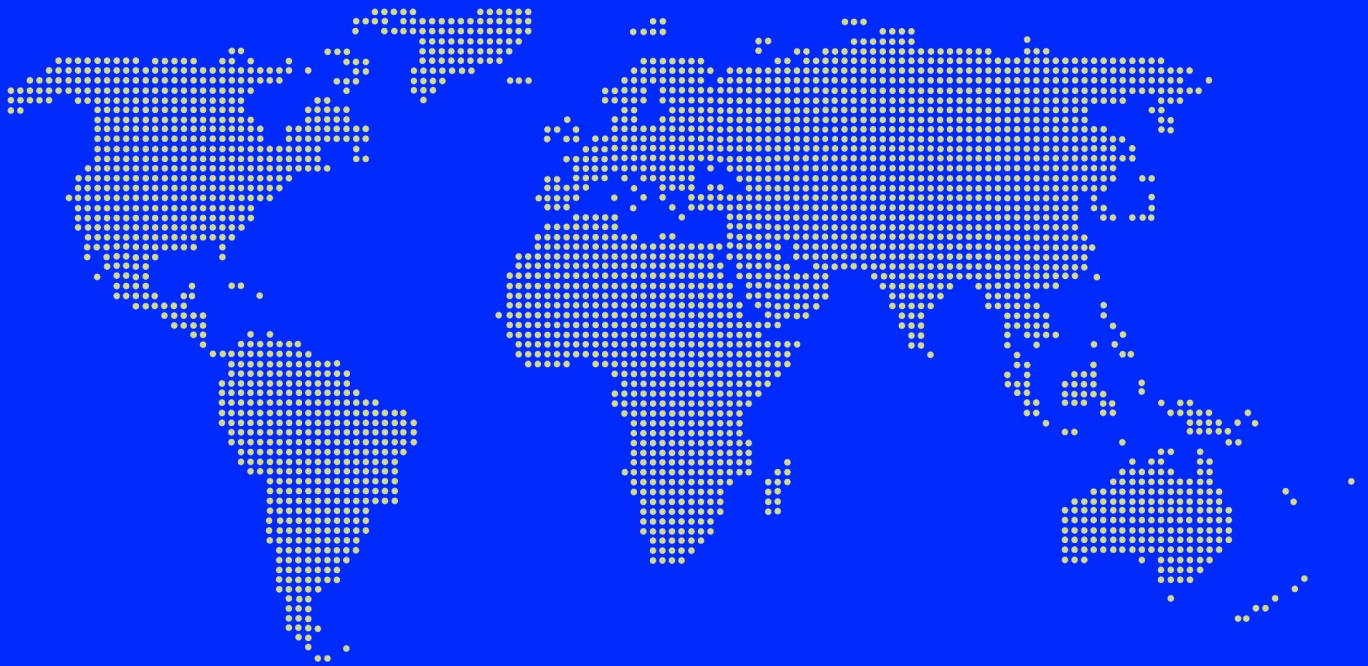
From our catalogue data, the cell type is PT1.2FPM300.

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).

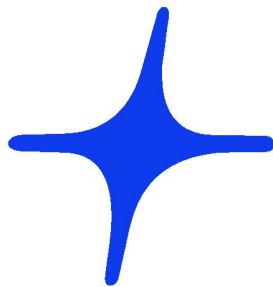




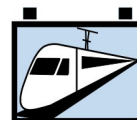
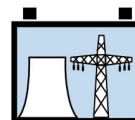
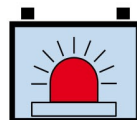
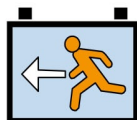
Guarantee

V4.0

NiCd Pocket Plate Range PT1.2FPH 10-500Ah



*»Premium quality for
uninterrupted communication«*





NiCd Pocket Plate Range
PT1.2 FPH 10-500Ah

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 behaviour 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 (-4°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.

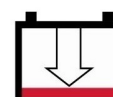
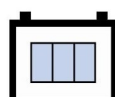
Good reserves and circulation of the electrolyte are achieved by a wide inter-plate space.

Injection moulded 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 vapours. 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.



Protective cover

- To prevent external short-circuits
- In line with EN 50272-2 (safety) with ip2 level

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

Horizontal pockets of double-perforated steel strips.

Cell container

Material: translucent/transparent polypropylene

Flame-arresting vents

Material: polypropylene.

Plate tab

Spot-welded both to the plate side-frames and to the upper edge of the pocket plate.

Separating grids

- These separate the plates and insulate the plate frames from each other.
- The grids allow free circulation of electrolyte between the plates.

Plate frame

Seals the plate pockets and serves as a current collector.

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

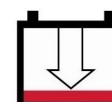
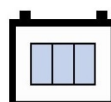
Application

PT1.2FPH Series cadmium batteries are designed for general industrial applications where absolute reliability is a necessity. Service-proven pocket-plate technology ensures long uninterrupted battery life without the risk of sudden loss of power.

PT1.2FPH Series batteries are suitable for high discharge rate applications (30 minutes and below) such as switchgear tripping, diesel engine starting, UPS, etc.

Performance Data

- ☐ High tolerance to electrical abuses such as overcharge and over discharge.
- ☐ High tolerance to rough handling and mechanical abuse due to strong components and robust construction.
- ☐ Trouble-free long cycle life.
- ☐ No risk of sudden death due to the chemistry and the cell structure.
- ☐ Wide operating temperature: -40°C to 60°C.
- ☐ Generous electrolyte reserve for long maintenance intervals.
- ☐ Clear (MBS) or translucent (PP) plastic cell case for easy electrolyte level inspection.
- ☐ Plastic grid spacers eliminate separator deterioration problem.
- ☐ Custom cell dimensions available.
- ☐ 20+ years service life in stationary applications.
- ☐ Conforms to IEC60623.



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:

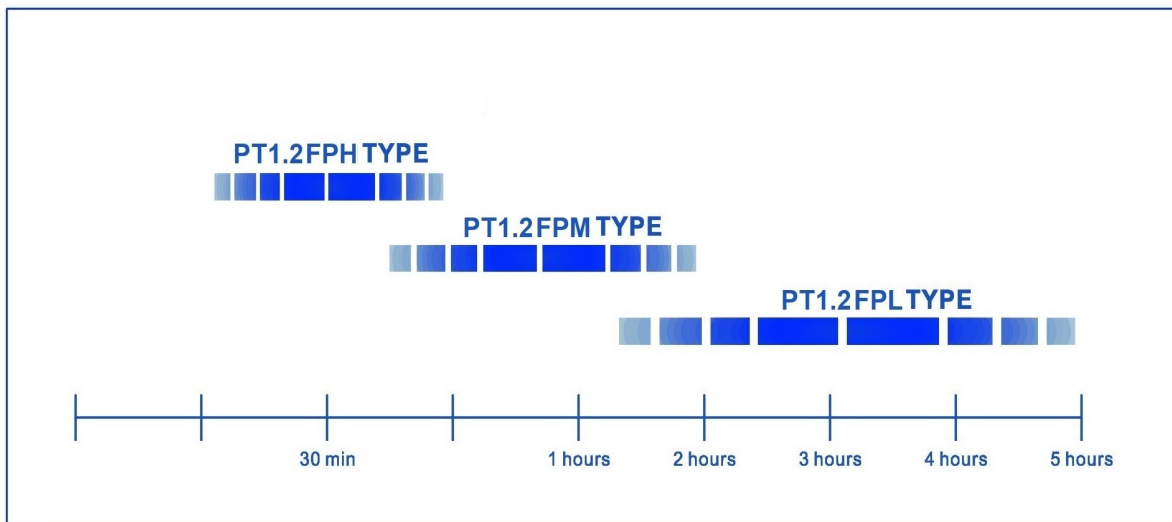
- Recommended charging voltage. 1.50 - 1.55 V/cell.

◆ 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

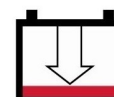
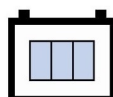
According to backup time required by application:



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.

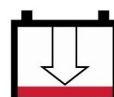
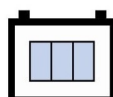
Recommended rates for the first charging: □ 0.2 C5A for 10 hours □ 0.1 C5A for 20 hours



NiCd Pocket Plate PT1.2FPH 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			
PT1.2 FPH10	1.2	10	55	2.2	134	5.3	270	10.6	1.2	2.6	2.2	4.8	M10	PP
PT1.2 FPH20	1.2	20	55	2.2	134	5.3	270	10.6	1.7	3.7	2.6	5.7	M10	PP
PT1.2 FPH30	1.2	30	70	2.8	140	5.5	295	11.6	2.8	6.2	4.3	9.5	M16	PP
PT1.2 FPH40	1.2	40	80	3.1	140	5.5	365	14.4	4.2	9.3	6	13.2	M16	PP
PT1.2 FPH50	1.2	50	80	3.1	140	5.5	365	14.4	4.5	9.9	6.2	13.7	M16	PP
PT1.2 FPH60	1.2	60	80	3.1	140	5.5	365	14.4	4.8	10.6	6.5	14.3	M16	PP
PT1.2 FPH70	1.2	70	105	4.1	165	6.5	345	13.6	6.8	15.0	9.2	20.3	M20	PP
PT1.2 FPH80	1.2	80	105	4.1	165	6.5	345	13.6	7.2	15.9	9.6	21.2	M20	PP
PT1.2 FPH90	1.2	90	105	4.1	165	6.5	345	13.6	7.8	17.2	10	22.0	M20	PP
PT1.2 FPH100	1.2	100	165	6.5	167	6.6	345	13.6	9.2	20.3	13.5	29.8	M20	PP
PT1.2 FPH120	1.2	120	165	6.5	167	6.6	345	13.6	9.8	21.6	14	30.9	M20	PP
PT1.2 FPH150	1.2	150	165	6.5	167	6.6	345	13.6	11	24.2	16	35.3	M20	PP
PT1.2 FPH200	1.2	200	170	6.7	285	11.2	350	13.8	18.5	40.8	26	57.3	2 x M20	ABS
PT1.2 FPH250	1.2	250	170	6.7	285	11.2	350	13.8	20	44.1	27.5	60.6	2 x M20	ABS
PT1.2 FPH300	1.2	300	175	6.9	290	11.4	500	19.7	25	55.1	36	79.3	2 x M20	ABS
PT1.2 FPH350	1.2	350	175	6.9	290	11.4	500	19.7	26	57.3	37	81.5	2 x M20	ABS
PT1.2 FPH400	1.2	400	186	7.3	398	15.7	565	22.2	41	90.4	55	121	3 x M20	ABS
PT1.2 FPH500	1.2	500	186	7.3	398	15.7	565	22.2	43	94.8	57	126	3 x M20	ABS

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



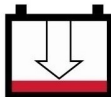
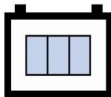
Discharge Data Table

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
PT1.2 FPH10	10	1.00	1.18	1.87	3.05	4.45	5.83	8.16	9.14	12.0	14.7	16.8	19.7	25.2	39.6	46.2	57.3	68.8
PT1.2 FPH20	20	2.01	2.36	3.74	6.12	8.95	11.7	16.5	18.5	24.7	30.2	34.4	37.0	51.1	80.3	93.0	118	124
PT1.2 FPH30	30	3.01	3.54	5.61	9.18	13.4	17.5	24.8	27.8	37.0	45.3	51.6	56.5	76.6	120	140	177	187
PT1.2 FPH40	40	4.02	4.72	7.48	12.2	17.9	23.3	33.1	37.0	49.4	60.4	68.8	76.0	102	161	186	237	249
PT1.2 FPH50	50	5.02	5.91	9.35	15.3	22.4	29.2	41.3	46.3	61.7	75.5	86.0	95.5	128	201	232	296	311
PT1.2 FPH60	60	6.02	7.09	11.2	18.4	26.8	35.1	49.6	55.5	74.1	90.6	103	115	153	241	279	355	373
PT1.2 FPH70	70	7.03	8.27	13.1	21.4	31.4	40.9	57.8	64.8	86.4	106	120	135	179	281	325	414	435
PT1.2 FPH80	80	8.03	9.45	14.9	24.4	35.8	46.8	66.1	74.0	98.7	121	138	154	204	321	372	473	498
PT1.2 FPH90	90	9.04	10.6	16.8	27.6	40.3	52.6	74.4	83.3	112	136	155	172	230	361	418	533	559
PT1.2 FPH100	100	10.1	11.9	18.7	30.6	44.7	58.5	82.6	92.6	124	151	172	191	255	401	465	591	621
PT1.2 FPH120	120	12.0	14.2	22.4	36.8	53.7	70.1	99.2	111	148	182	206	230	307	482	558	710	745
PT1.2 FPH150	150	15.1	17.8	28.0	45.9	67.2	87.7	124	139	185	226	258	306	383	603	698	888	932
PT1.2 FPH200	200	20.1	23.6	37.4	61.2	89.5	117	165	185	247	302	344	382	511	804	930	1183	1243
PT1.2 FPH250	250	25.1	29.5	46.7	76.5	111	146	207	232	309	377	430	517	638	1005	1162	1479	1553
PT1.2 FPH300	300	30.1	35.5	56.1	91.8	134	175	248	277	371	453	516	573	766	1206	1395	1774	1864
PT1.2 FPH350	350	35.2	41.4	65.4	107	156	204	289	324	432	529	602	688	894	1406	1628	2071	2175
PT1.2 FPH400	400	40.2	47.3	74.7	122	179	234	330	370	494	604	688	766	1022	1607	1860	2366	2486
PT1.2 FPH500	500	50.2	59.0	93.4	153	224	292	413	463	617	755	860	957	1278	2010	2325	2958	3107



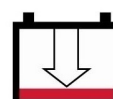
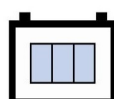
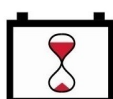
Discharge Data Table

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
PT1.2 FPH10	10	1.01	1.22	1.93	3.18	4.67	6.11	8.69	10.4	14.2	17.4	19.8	23.5	29.7	46.0	53.6	69.1	72.7
PT1.2 FPH20	20	2.04	2.45	3.88	6.37	9.36	12.2	17.5	21.1	29.2	35.8	40.8	48.2	60.7	93.8	108	136	151
PT1.2 FPH30	30	3.06	3.67	5.82	9.55	14.0	18.4	26.3	31.6	43.9	53.7	61.2	72.3	91.0	141	163	203	228
PT1.2 FPH40	40	4.07	4.89	7.76	12.7	18.7	24.4	35.1	42.1	58.5	71.6	81.6	96.4	121	188	217	271	304
PT1.2 FPH50	50	5.09	6.11	9.70	15.9	23.4	30.6	43.9	52.7	73.2	89.5	102	121	152	234	271	339	379
PT1.2 FPH60	60	6.11	7.33	11.6	19.1	28.0	36.8	52.7	63.2	87.8	107	122	144	182	282	326	407	456
PT1.2 FPH70	70	7.13	8.56	13.5	22.2	32.7	42.8	61.5	73.8	102	125	142	169	212	328	379	474	532
PT1.2 FPH80	80	8.15	9.78	15.5	25.5	37.4	49.0	70.3	84.3	117	143	164	192	243	375	434	542	607
PT1.2 FPH90	90	9.12	10.9	17.5	28.6	42.0	55.1	79.1	94.9	132	161	184	217	273	422	488	610	683
PT1.2 FPH100	100	10.2	12.3	19.4	31.8	46.8	61.2	87.9	105	146	179	204	240	303	469	542	677	760
PT1.2 FPH120	120	12.2	14.7	23.3	38.2	56.1	73.4	106	127	176	215	245	289	364	562	650	813	911
PT1.2 FPH150	150	15.3	18.3	29.0	47.8	70.2	91.7	132	159	220	268	306	362	455	704	813	1016	1139
PT1.2 FPH200	200	20.4	24.4	38.8	63.6	93.5	123	176	211	293	358	408	482	606	938	1085	1354	1518
PT1.2 FPH250	250	25.5	30.6	48.5	79.6	117	153	220	264	366	447	511	602	758	1173	1356	1693	1898
PT1.2 FPH300	300	30.6	36.7	58.1	95.4	140	183	264	317	439	537	612	722	910	1407	1626	2031	2278
PT1.2 FPH350	350	35.6	42.8	67.9	111	163	214	307	369	513	626	715	842	1061	1641	1897	2371	2657
PT1.2 FPH400	400	40.8	48.9	77.6	127	187	245	352	422	586	715	816	963	1213	1875	2168	2709	3036
PT1.2 FPH500	500	50.9	61.1	97.0	159	233	306	439	527	732	895	1021	1204	1515	2344	2710	3386	3796



NiCd Pocket Plate Range

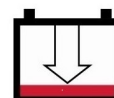
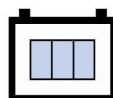
Discharge Data Table

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
PT1.2 FPH10	10	1.03	1.25	2.00	3.27	4.83	6.4	9.3	11.0	16.5	20.8	23.6	27.9	35.3	54.4	63.9	78.8	85.9
PT1.2 FPH20	20	2.08	2.51	3.98	6.55	9.67	12.8	18.6	22.1	33.3	43.1	48.7	57.7	72.5	112	127	145	171
PT1.2 FPH30	30	3.12	3.76	5.97	9.82	14.5	19.2	27.9	33.2	49.9	64.6	73.1	86.5	109	167	191	221	257
PT1.2 FPH40	40	4.16	5.01	7.96	13.1	19.4	25.6	37.1	44.3	66.5	86.1	97.5	115	145	223	255	297	344
PT1.2 FPH50	50	5.19	6.27	9.95	16.4	24.2	32.1	46.4	55.3	83.2	107	122	145	181	279	317	373	430
PT1.2 FPH60	60	6.23	7.52	11.9	19.6	29.1	38.4	56.0	66.4	99.6	129	146	173	218	334	381	450	515
PT1.2 FPH70	70	7.27	8.77	13.9	23.0	33.9	44.5	65.2	77.5	117	151	171	202	254	391	445	526	601
PT1.2 FPH80	80	8.31	10.0	16.0	26.2	38.7	51.6	74.4	88.6	133	172	195	230	290	446	509	602	687
PT1.2 FPH90	90	9.31	11.3	17.9	29.4	43.6	57.4	83.5	100	150	194	219	260	327	501	572	671	772
PT1.2 FPH100	100	10.4	12.6	19.9	32.8	48.3	64.5	92.6	111	167	215	244	288	362	558	636	747	858
PT1.2 FPH120	120	12.5	15.0	23.8	39.2	58.0	76.8	111	133	199	258	293	346	435	669	763	899	1030
PT1.2 FPH150	150	15.6	18.8	29.8	49.1	72.6	96.5	139	167	249	323	365	433	544	836	954	1196	1288
PT1.2 FPH200	200	20.8	25.0	39.8	65.4	96.8	128	185	222	333	430	487	577	725	1115	1272	1494	1716
PT1.2 FPH250	250	26.0	31.3	49.7	81.8	121	161	232	277	416	538	609	721	906	1394	1590	2020	2147
PT1.2 FPH300	300	31.2	37.6	59.7	98.2	145	193	279	333	500	645	731	865	1088	1673	1908	2241	2576
PT1.2 FPH350	350	36.3	43.9	69.6	114.2	169	225	325	387	583	753	853	1009	1269	1952	2225	2690	3005
PT1.2 FPH400	400	41.6	50.1	79.6	130.6	193	256	372	443	665	861	975	1153	1450	2231	2543	2995	3434
PT1.2 FPH500	500	51.9	62.6	99.5	163.5	242	321	464	554	832	1076	1218	1442	1813	2789	3179	3742	4292



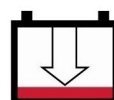
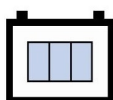
Discharge Data Table

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: 1.00V/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
PT1.2 FPH10	10	1.05	1.27	2.02	3.32	5.0	6.55	9.59	11.2	17.3	23.3	27.2	32.1	41.1	64.2	72.4	91.7	98.4
PT1.2 FPH20	20	2.11	2.53	4.04	6.64	10.0	13.1	19.2	22.5	35.1	47.8	56.1	66.6	84.8	128	146	184	203
PT1.2 FPH30	30	3.17	3.79	6.06	10.0	15.0	19.6	28.8	33.8	52.7	71.7	84.1	99.7	127	192	218	275	305
PT1.2 FPH40	40	4.22	5.06	8.08	13.3	19.9	26.3	38.4	45.0	70.2	95.6	112	133	170	255	291	367	406
PT1.2 FPH50	50	5.27	6.32	10.1	16.6	24.9	32.8	48.0	56.3	87.7	120	140	166	212	319	364	458	508
PT1.2 FPH60	60	6.33	7.58	12.1	19.9	29.9	39.3	57.6	67.9	106	144	168	200	255	383	437	550	610
PT1.2 FPH70	70	7.38	8.84	14.1	23.3	34.9	45.9	67.1	79.0	123	167	196	233	297	446	510	641	712
PT1.2 FPH80	80	8.44	10.1	16.2	26.6	39.9	52.5	76.6	90.1	140	191	224	266	339	511	582	734	813
PT1.2 FPH90	90	9.48	11.4	18.2	30.0	44.8	59.0	86.3	101	158	215	252	299	381	574	655	825	915
PT1.2 FPH100	100	10.6	12.7	20.2	33.2	49.8	65.6	95.9	112	176	239	281	332	424	638	728	917	1017
PT1.2 FPH120	120	12.6	15.2	24.2	39.9	59.7	78.7	115	135	211	287	336	399	509	766	874	1101	1219
PT1.2 FPH150	150	15.8	18.9	30.3	49.9	74.6	98.4	144	169	263	358	420	499	636	957	1092	1375	1525
PT1.2 FPH200	200	21.1	25.3	40.4	66.5	99.5	131	192	225	351	478	560	665	848	1277	1457	1834	2033
PT1.2 FPH250	250	26.4	31.5	50.5	83.1	124	164	240	281	439	598	701	832	1060	1595	1821	2293	2541
PT1.2 FPH300	300	31.7	37.9	60.6	99.7	149	197	287	338	527	717	841	997	1272	1914	2185	2752	3049
PT1.2 FPH350	350	36.9	44.2	70.7	116	174	230	336	393	615	836	980	1164	1484	2233	2549	3210	3557
PT1.2 FPH400	400	42.1	50.5	80.8	133	199	263	383	450	702	956	1121	1330	1696	2553	2913	3669	4065
PT1.2 FPH500	500	52.7	63.2	101	167	249	328	479	563	878	1195	1401	1662	2121	3191	3641	4586	5081



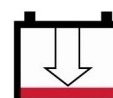
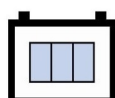
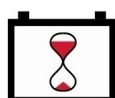
Discharge Data Table

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: 0.85V/cell

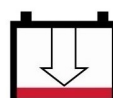
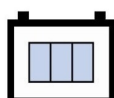
Cell Type	Capacity (C5 Ah)	Discharge Time in Seconds					
		90	60	30	10	5	1
PT1.2 FPH10	10	94	102	116	131	141	153
PT1.2 FPH20	20	189	205	228	261	284	308
PT1.2 FPH30	30	284	308	343	393	425	461
PT1.2 FPH40	40	376	409	457	524	566	615
PT1.2 FPH50	50	471	512	572	655	708	768
PT1.2 FPH60	60	565	614	685	785	850	921
PT1.2 FPH70	70	660	715	800	916	991	1076
PT1.2 FPH80	80	754	817	913	1047	1133	1229
PT1.2 FPH90	90	847	920	1028	1178	1275	1383
PT1.2 FPH100	100	941	1022	1142	1309	1416	1536
PT1.2 FPH120	120	1130	1226	1362	1571	1699	1844
PT1.2 FPH150	150	1414	1534	1713	1964	2124	2305
PT1.2 FPH200	200	1897	2004	2285	2619	2831	3073
PT1.2 FPH250	250	2355	2556	2856	3272	3540	3841
PT1.2 FPH300	300	2825	3066	3427	3927	4248	4608
PT1.2 FPH350	350	3297	3577	3975	4582	4957	5376
PT1.2 FPH400	400	3794	4088	4569	5236	5664	6145
PT1.2 FPH500	500	4708	5110	5710	6546	7080	7681



Discharge Data Table

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

Cell Type	Capacity (C5 Ah)	Discharge Time in Seconds					
		90	60	30	10	5	1
PT1.2 FPH10	10	94	103	110	133	146	158
PT1.2 FPH20	20	187	206	221	265	291	316
PT1.2 FPH30	30	281	310	331	398	437	474
PT1.2 FPH40	40	374	413	441	530	583	631
PT1.2 FPH50	50	469	516	552	663	729	789
PT1.2 FPH60	60	562	619	662	795	874	947
PT1.2 FPH70	70	656	723	772	928	1020	1105
PT1.2 FPH80	80	749	826	882	1061	1166	1263
PT1.2 FPH90	90	842	929	993	1193	1311	1421
PT1.2 FPH100	100	936	1032	1103	1326	1457	1579
PT1.2 FPH120	120	1123	1239	1324	1591	1749	1894
PT1.2 FPH150	150	1405	1548	1655	1989	2186	2368
PT1.2 FPH200	200	1872	2064	2206	2651	2915	3157
PT1.2 FPH250	250	2341	2581	2758	3314	3643	3947
PT1.2 FPH300	300	2808	3097	3309	3977	4372	4736
PT1.2 FPH350	350	3277	3613	3861	4640	5100	5526
PT1.2 FPH400	400	3744	4129	4412	5303	5829	6315
PT1.2 FPH500	500	4681	5161	5515	6629	7286	7894



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.

$$\text{Number of cells required} = \frac{\text{Circuit voltage}}{\text{Cell Float voltage}} \quad \text{Minimum cell voltage} = \frac{\text{Minimum D.C. voltage}}{\text{Number of cells}}$$

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 up 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) = $265/1.44 \approx 184$ cells

-Minimum Cell Voltage = $202/184 \approx 1.10$ volts per cell

-Maximum Battery Current

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

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

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 PT1.2FPL Range.

From our catalogue data, the cell type is PT1.2FPH300.

Battery shall comprise 184 cells of NILE Nickel Cadmium type PT1.2FPH300.

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).

