

FH

Nickel Cadmium Fibre Plate Batteries

(Fibre Positive and Pasted Negative (PBE) Technology)



Construction

Nickel cadmium FH batteries are constructed using Fibre positive and Pasted Negative electrodes. The Fibre positive electrode employed in this FH range allows 90% of the electrode volume available for the active material. The three dimensional Fibre structure provides a very high conducting density and ensures that the active material is accessed during current collection, thereby giving an excellent electrical performance.

The pasted negative electrodes are designed with high power density and has less water consumption, thus reduces the periodicity of topping –up the cells with DI water. The sintered micro-porous separators and membrane separators provide insulation between the plates and permits free flow of electrolyte.

Cell Construction

Flame arresting flip-open vent cap

Prevents explosion and electrolyte contamination

Terminal arrangement

Nickel-plated copper terminal posts provide good electrical conductivity

Polypropylene container

Fusion welded to lids, make the cell mechanically sturdy. Flame retardant Case (Optional)

Electrodes

Made of Nickel plated fibre matrix to hold the active material, which provides good conductivity and ensures excellent electrical performance

Separator

Micro-porous separator ensures insulation between the plates without hampering electrolyte flow



These batteries are built in polypropylene containers to which lids are thermally welded to withstand impact resistance. This type of cells are translucent in nature, so electrolyte levels can be visualized. Flame retardant containers in the other hand are Opaque in nature, so the levels of electrolyte is not visible. If requested by the customer, flame retardant cells can be offered.

Steel or Copper terminals and fasteners give these batteries the ruggedness required to meet the demanding application needs. Single cells are provided with reliable flame-arresting vents and are assembled in stainless steel crates for easy handling.



Features & Benefits :

- Excellent high rate performance to suit application requirements.
- Compact and light weight.
- Performs reliably at extreme temperatures (+40 to -20 deg C)
- Reduced maintenance requirements.
- Long life
- Reliable construction (no risk of sudden death).
- Can withstand extreme temperature without damage (+70 to -50 deg C)
- High resistance to electrical abuse.
- Quick charge capability (accepts more than 90% of charge within 5 hours).
- No change of electrolyte during its lifetime.

Standards:

The batteries conform to the following international standards:

1. IEC 60623
2. BS 6260
3. UIC 854R
4. IEC 60077
5. NFF 64018

Applications:

FH batteries are made to suit high rate applications, with duration varying between 30 minutes and 1 hour.

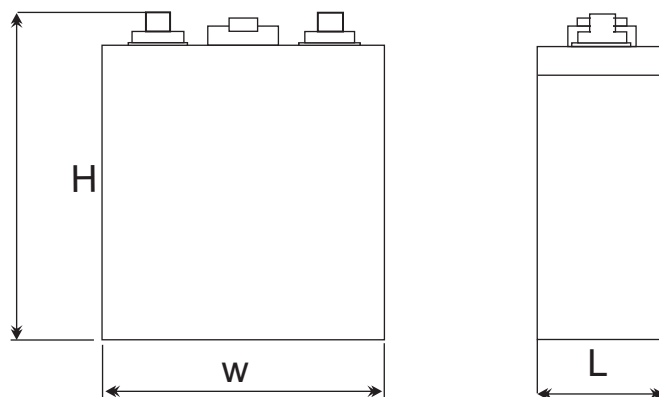
Typical applications are

1. Engine starting
2. UPS
3. Switchgear
4. Emergency back-up



Dimensional details of FH cells (High rate cells)

Type	Rated Capacity (C ₅ Ah)	Length(L)in mm	Width(W) mm	Height(H) in mm	Weight in Kg	Electrolyte Reserve (CC)
FH 11P	11	46	86	196	1.0	66
FH 16P	16	46	86	276	1.5	160
FH 21P	21	46	86	276	1.6	160
FH 24P	24	46	86	276	1.9	155
FH 28P	28	61	86	276	2.0	215
FH 36P	36	86	86	276	2.7	325
FH 45P	45	86	86	276	2.9	315
FH 52P	52	86	86	276	2.9	315
FH 60P	60	86	86	306	3.4	405
FH 70P	70	86	86	306	3.5	405
FH 80P	80	86	86	306	3.5	390
FH 90P	90	78	166	339	5.8	750
FH 100P	100	78	166	339	6.0	735
FH 115P	115	78	166	339	6.3	720
FH 130P	130	87	166	339	7.1	815
FH 150P	150	103	166	339	8.2	990
FH 170P	170	117	166	339	9.7	1135
FH 190P	190	117	166	339	10.0	1115
FH 220P	220	138	166	339	13.2	1340
FH 250P	250	138	166	339	13.4	1320
FH 280P	280	138	166	339	13.8	1300
FH 300P	300	202	166	339	16.1	2060
FH 320P	320	202	166	339	16.5	2030



Electrical performance

Discharge performance in Amperes

After prolonged float charge of fully charged cells

at +20 deg C, to end voltage of 1.14 V/Cell

Type	Rated Capacity (C5 Ah)	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
FH 11P	11	1.3	2.1	3.4	5.1	6.5	8.7	15.3	18.6	21.0	24.0	27.9	37.7	43.4	54.4	60.7
FH 16P	16	2.0	3.1	4.9	7.3	9.5	12.6	22.2	27.0	30.6	34.9	40.5	54.8	63.1	79.2	88.4
FH 21P	21	2.6	4.1	6.6	9.6	12.4	16.7	29.2	35.5	40.2	45.9	53.1	71.9	82.9	104	116
FH 24P	24	2.9	4.6	7.5	11.0	14.1	19.0	33.3	40.5	45.9	52.4	60.7	82.2	94.7	119	132
FH 28P	28	3.4	5.4	8.7	12.8	16.6	22.1	38.9	47.3	53.5	61.1	70.8	96.0	110	138	155
FH 36P	36	4.4	6.9	11.2	16.5	21.3	28.5	50.0	60.7	68.9	78.6	91.1	123	142	178	199
FH 45P	45	5.6	8.7	14.0	20.6	26.6	35.7	62.5	75.9	86.1	98.3	114	155	178	223	248
FH 52P	52	6.5	10.0	16.2	23.7	30.7	41.1	72.2	87.7	99.5	113	131	178	205	258	287
FH 60P	60	7.5	11.6	18.7	27.4	35.5	47.5	78.5	92.5	102	118	137	198	230	284	312
FH 70P	70	8.7	13.5	21.8	32.0	41.3	55.3	91.6	108	119	132	148	231	269	332	364
FH 80P	80	9.9	15.4	24.9	36.6	47.3	63.3	105	123	135	152	170	264	307	379	417
FH 90P	90	11.1	17.4	28.1	41.1	53.1	71.2	106	125	136	159	194	297	345	426	469
FH 100P	100	12.4	19.3	31.2	45.7	59.1	79.1	113	134	153	177	215	330	384	474	521
FH 115P	115	14.2	22.2	35.9	52.5	68.0	91.0	129	155	175	203	247	380	441	544	599
FH 130P	130	16.1	25.1	40.5	59.4	76.8	103	146	175	198	229	280	429	499	615	677
FH 150P	150	18.6	29.0	46.8	68.6	88.6	119	170	201	228	265	323	495	575	710	782
FH 170P	170	21.0	32.8	53.0	77.7	100	134	192	228	259	300	366	561	651	805	886
FH 190P	190	23.5	36.7	59.2	86.9	112	150	214	255	289	335	409	627	728	899	990
FH 220P	220	27.3	42.5	68.6	100	130	174	248	295	334	388	474	726	843	1040	1140
FH 250P	250	30.9	48.3	78.0	114	147	198	282	335	380	440	538	825	958	1180	1300
FH 280P	280	34.6	54.1	87.3	128	166	221	316	376	425	494	602	924	1070	1320	1450
FH 300P	300	37.2	57.9	93.5	137	177	237	338	403	456	528	645	990	1150	1420	1570
FH 320P	320	39.6	61.8	99.8	146	189	254	361	429	487	564	689	1060	1220	1510	1670



Electrical performance

Discharge performance in Amperes
 After prolonged float charge of fully charged cells
 at +20 deg C, to end voltage of 1.10 V/Cell

Type	Rated Capacity (C5 Ah)	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
FH 11P	11	1.4	2.1	3.5	5.4	7.0	10.0	17.8	22.7	26.1	30.1	35.2	45.6	52.1	64.6	72.0
FH 16P	16	2.0	3.1	5.3	7.7	10.1	14.5	25.8	33.1	37.9	43.7	51.2	66.3	75.9	94.0	105
FH 21P	21	2.6	4.1	6.9	10.1	13.3	19.1	33.8	43.4	49.7	57.4	67.3	86.9	100	123	137
FH 24P	24	3.0	4.7	7.8	11.6	15.2	21.8	38.7	49.6	56.8	65.7	76.9	99.3	114	141	158
FH 28P	28	3.5	5.5	9.1	13.5	17.8	25.5	45.1	57.9	66.3	76.6	89.6	116	132	165	184
FH 36P	36	4.5	7.1	11.7	17.4	22.8	32.7	58.0	74.4	85.1	98.4	115	149	171	212	235
FH 45P	45	5.7	8.8	14.6	21.7	28.5	40.9	72.5	93.0	106	123	144	186	213	265	295
FH 52P	52	6.6	10.2	16.9	25.0	32.9	47.3	83.8	108	123	142	167	215	246	306	340
FH 60P	60	7.6	11.8	19.5	28.9	38.0	54.5	93.5	116	129	148	176	238	275	337	364
FH 70P	70	8.8	13.7	22.7	33.7	44.3	63.6	109	135	152	168	191	277	321	394	424
FH 80P	80	10.0	15.7	26.1	38.6	50.7	72.7	125	155	173	192	218	317	367	450	485
FH 90P	90	11.3	17.6	29.3	43.4	57.0	81.8	128	156	176	202	245	357	413	506	545
FH 100P	100	12.5	19.6	32.5	48.2	63.3	90.9	143	173	195	224	273	397	459	562	606
FH 115P	115	14.4	22.5	37.4	55.4	72.8	105	165	199	224	259	314	456	527	646	697
FH 130P	130	16.3	25.5	42.3	62.7	82.3	118	186	225	254	292	355	515	596	730	788
FH 150P	150	18.8	29.4	48.8	72.3	94.9	135	214	260	293	336	409	595	688	842	909
FH 170P	170	21.3	33.3	55.3	81.9	108	155	243	294	331	382	464	674	780	955	1030
FH 190P	190	23.8	37.3	61.8	91.6	120	173	272	329	371	426	518	753	872	1070	1150
FH 220P	220	27.6	43.1	71.6	106	139	200	314	381	429	494	600	873	1010	1230	1330
FH 250P	250	31.4	49.0	81.3	120	159	227	358	432	488	562	683	991	1150	1400	1510
FH 280P	280	35.1	54.9	91.1	135	178	255	400	485	546	662	765	1110	1280	1580	1700
FH 300P	300	37.7	58.8	97.6	144	190	273	429	519	586	674	819	1190	1370	1690	1820
FH 320P	320	40.2	62.7	104	155	203	291	458	554	624	718	874	1270	1460	1800	1940



Electrical performance

Discharge performance in Amperes
 After prolonged float charge of fully charged cells
 at +20 deg C, to end voltage of 1.05 V/Cell

Type	Rated Capacity (C5 Ah)	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
FH 11P	11	1.4	2.2	3.6	5.5	7.2	10.6	20.4	27.8	33.0	38.7	44.3	55.9	62.9	77.7	86.5
FH 16P	16	2.0	3.2	5.4	7.9	10.4	15.4	29.7	40.4	48.0	56.3	64.5	81.2	91.4	113	126
FH 21P	21	2.6	4.2	7.0	10.4	13.6	20.2	38.9	53.0	63.0	73.8	84.7	107	120	148	166
FH 24P	24	3.0	4.8	8.0	11.9	15.7	23.1	44.4	60.6	72.0	84.4	96.9	122	137	170	189
FH 28P	28	3.5	5.6	9.3	13.8	18.3	27.0	51.9	70.7	84.0	98.5	113	142	161	198	220
FH 36P	36	4.6	7.1	11.9	17.8	23.4	34.6	66.8	90.9	108	126	145	183	206	255	283
FH 45P	45	5.8	8.9	14.9	22.3	29.3	43.3	83.4	114	135	159	182	228	258	318	354
FH 52P	52	6.6	10.3	17.3	25.8	33.8	50.0	96.4	131	156	183	210	264	297	368	409
FH 60P	60	7.6	11.9	19.9	29.7	39.1	57.7	110	146	170	189	220	293	330	404	438
FH 70P	70	8.9	13.9	23.2	34.6	45.7	67.4	128	171	198	220	242	342	385	471	511
FH 80P	80	10.2	15.9	26.6	39.6	52.1	77.0	146	195	225	251	277	391	440	539	584
FH 90P	90	11.4	17.9	26.6	44.5	58.7	86.6	159	204	232	265	310	439	495	606	657
FH 100P	100	12.7	19.8	33.2	49.5	65.1	96.2	177	227	259	294	344	488	549	674	730
FH 115P	115	14.6	22.8	38.2	57.0	74.9	111	203	262	297	338	397	562	632	775	839
FH 130P	130	16.6	25.8	43.2	64.3	84.7	125	229	295	335	383	448	634	715	876	949
FH 150P	150	19.1	29.8	49.8	74.2	97.8	144	265	340	387	441	517	732	825	1010	1090
FH 170P	170	21.6	33.7	56.5	84.1	111	165	300	386	438	500	586	829	934	1140	1240
FH 190P	190	24.1	37.7	63.1	94.0	124	183	335	431	490	559	654	927	1040	1280	1380
FH 220P	220	28.0	43.7	73.1	109	143	212	388	500	568	647	759	1070	1210	1480	1610
FH 250P	250	31.7	49.6	83.0	124	163	240	440	568	645	735	862	1210	1370	1690	1830
FH 280P	280	35.6	55.6	93.0	138	183	270	494	636	722	824	966	1360	1540	1890	2040
FH 300P	300	38.1	59.5	99.7	148	196	289	529	682	775	883	1030	1462	1650	2020	2190
FH 320P	320	40.7	63.5	106	159	209	308	565	726	826	941	1100	1570	1760	2150	2330



Electrical performance

Discharge performance in Amperes
 After prolonged float charge of fully charged cells
 at +20 deg C, to end voltage of 1.00 V/Cell

Type	Rated Capacity (C5 Ah)	Hours						Minutes						Seconds		
		8	5	3	2	1.5	1	30	20	15	10	5	1	30	5	1
FH 11P	11	1.4	2.2	3.6	5.6	7.3	10.7	20.8	29.9	36.3	45.8	53.3	66.9	73.8	91.0	101
FH 16P	16	2.0	3.2	5.4	8.0	10.5	15.6	30.3	43.4	52.8	66.5	77.6	97.4	108	133	146
FH 21P	21	2.7	4.2	7.1	10.5	13.8	20.5	39.8	57.1	69.3	87.3	102	128	141	175	193
FH 24P	24	3.0	4.8	8.1	11.9	15.9	23.3	45.5	65.2	79.2	100	116	146	162	199	220
FH 28P	28	3.6	5.6	9.4	13.9	18.5	27.3	53.0	76.1	92.3	116	136	171	189	232	257
FH 36P	36	4.6	7.2	12.0	18.0	23.7	35.0	68.2	97.8	119	149	175	218	242	298	331
FH 45P	45	5.8	9.0	15.0	22.4	29.7	43.8	85.2	122	148	187	219	274	303	373	414
FH 52P	52	6.7	10.4	17.4	25.9	34.2	50.6	98.5	141	172	216	253	316	349	430	478
FH 60P	60	7.6	12.0	20.1	29.9	39.6	58.5	113	161	192	227	272	344	386	472	508
FH 70P	70	8.9	14.0	23.4	34.8	46.2	68.2	131	188	223	266	295	401	451	551	592
FH 80P	80	10.3	16.0	26.8	39.8	52.7	77.9	150	214	256	303	337	459	515	629	677
FH 90P	90	11.5	18.0	30.1	44.8	59.3	87.7	167	232	271	320	379	516	580	708	762
FH 100P	100	12.8	20.0	33.4	49.8	66.0	97.4	185	258	300	356	421	574	644	787	846
FH 115P	115	14.7	23.0	38.5	57.3	75.9	112	212	296	345	409	484	660	740	905	974
FH 130P	130	16.7	26.0	43.5	64.7	85.7	126	240	335	390	463	547	745	837	1020	1100
FH 150P	150	19.2	30.0	50.2	74.7	98.9	146	277	387	450	533	631	861	967	1180	1270
FH 170P	170	21.8	34.0	56.9	84.6	112	166	314	438	510	605	715	975	1090	1330	1430
FH 190P	190	24.3	38.0	63.6	94.6	125	185	350	490	571	676	799	1090	1220	1490	1610
FH 220P	220	28.2	44.0	73.6	109	144	214	406	567	661	783	925	1260	1410	1730	1860
FH 250P	250	32.0	50.0	83.6	124	165	243	462	644	750	890	1050	1430	1610	1970	2120
FH 280P	280	35.9	56.0	93.7	139	184	273	517	721	840	996	1180	1610	1810	2200	2370
FH 300P	300	38.5	60.0	100	148	197	292	553	773	901	1070	1260	1720	1930	2360	2540
FH 320P	320	41.0	64.0	107	159	210	312	591	824	961	1140	1340	1840	2060	2510	2710



Electrical performance

Discharge performance in Amperes
 After prolonged float charge of fully charged cells
 at +20 deg C, to end voltage of 0.85 V/Cell

Type	Rated Capacity (C5 Ah)	Minutes			Seconds			
		3	1.5	1	30	15	5	1
FH 11P	11	96	108	116	125	134	149	164
FH 16P	16	140	158	169	183	196	217	237
FH 21P	21	184	207	221	239	257	285	312
FH 24P	24	210	236	253	274	294	326	357
FH 28P	28	245	276	295	319	342	380	416
FH 36P	36	316	355	379	411	440	489	535
FH 45P	45	395	443	474	514	550	611	669
FH 52P	52	456	513	546	594	636	706	773
FH 60P	60	477	556	603	671	734	815	869
FH 70P	70	557	649	703	783	856	951	1010
FH 80P	80	637	742	804	895	979	1080	1150
FH 90P	90	715	834	904	1010	1100	1220	1300
FH 100P	100	795	926	1000	1120	1220	1350	1440
FH 115P	115	894	1050	1130	1260	1380	1530	1620
FH 130P	130	1010	1160	1260	1400	1530	1690	1800
FH 150P	150	1160	1340	1450	1620	1760	1950	2070
FH 170P	170	1350	1580	1710	1900	2070	2300	2450
FH 190P	190	1510	1760	1910	2120	2320	2580	2740
FH 220P	220	1710	2000	2160	2410	2650	2920	3090
FH 250P	250	1940	2270	2450	2750	3010	3320	3500
FH 280P	280	2170	2500	2710	3030	3280	3640	3860
FH 300P	300	2320	2690	2900	3240	3510	3900	4140
FH 320P	320	2410	2790	3020	3360	3680	4040	4310



Electrical performance

Discharge performance in Amperes
After prolonged float charge of fully charged cells
at +20 deg C, to end voltage of 0.65 V/Cell

Type	Rated Capacity (C5 Ah)	Minutes		Seconds			
		1.5	1	30	15	5	1
FH 11P	11	150	163	179	187	204	227
FH 16P	16	219	236	260	273	297	331
FH 21P	21	288	310	341	358	389	434
FH 24P	24	328	355	390	408	444	497
FH 28P	28	384	414	455	477	519	580
FH 36P	36	493	532	585	613	667	745
FH 45P	45	616	665	731	766	834	931
FH 52P	52	712	769	845	885	964	1080
FH 60P	60	747	828	939	1010	1110	1200
FH 70P	70	879	960	1090	1170	1290	1400
FH 80P	80	1000	1100	1250	1340	1470	1600
FH 90P	90	1130	1240	1410	1510	1670	1810
FH 100P	100	1250	1380	1580	1680	1850	2010
FH 115P	115	1410	1550	1780	1880	2100	2250
FH 130P	130	1590	1740	1970	2100	2310	2490
FH 150P	150	1840	2010	2270	2420	2670	2880
FH 170P	170	2130	2340	2680	2860	3150	3410
FH 190P	190	2380	2620	2990	3190	3520	3820
FH 220P	220	2710	2980	3390	3600	4030	4310
FH 250P	250	3080	3390	3860	4090	4580	4900
FH 280P	280	3420	3570	4240	4520	4980	5380
FH 300P	300	3670	4010	4540	4850	5340	5770
FH 320P	320	3800	4200	4760	5020	5530	5990

Data is only for the purpose of illustration and subject to changes without prior notification

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