

Narada

stored energy solutions for a demanding world

Narada HELiON™ NPFC series 48V LiFePO₄ battery modules are ideally suited for telecom base station, OSP, and renewable energy applications.

NPFC series offer long cycle life, small size, reduced weight, and simplified installation as 19"/23" rack mountable modules.

NPFC chemistry makes it one of the safest technologies, suitable for high and low temperature operation and capable of 1C and higher discharge rates.

HELiON
LI-ION ENERGY



Technical Features:

- Simple installation and load/charge system integration (Pos/Neg termination)
- Advanced intelligent lithium battery management technology
- Energy transfer patented technology provides high cell utilization efficiency for prolong system operational life.
- Configuration flexibility, support parallel connection expansion up to 16 modules

BMS - Alarming

- System monitoring of voltage, current, temperature of cells and module. Built in protection against; over-current on discharge and recharge, over-temperature, low temperature, low and high voltage, and short circuit.
- BMS maintenance and service communication via RS232 or RS485
- 2 levels of remote alarming through dry contacts

Compliance

UL1642, Standard for Lithium Batteries

UL2054, Standard for Household and Commercial Batteries

EN 61000-6-1:2007, Electromagnetic compatibility (EMC)

EN 61000-6-3:2007+A1:2011, Electromagnetic compatibility (EMC)

IEC 62133:2012, Battery Safety Testing

UL1973, Standard for -cells

NEBS Level 1 Certified GR-1089 / GR-63

UN3800

NPFC-Series Li-Ion LiFePO₄

Chemistry Comparison

Feature	Narada NPFC LiFePO ₄	LiCoO ₂	Li(NiCoMn) ₁ O ₂	LiMn ₂ O ₄
Crystal structure	Olivine	layer	layer	spinel
Theoretical Specific Capacity/mAh·g ⁻¹	170	274	278	148
Practical Specific Capacity/mAh·g ⁻¹	130~150	140~155	130~220	90~120
Working voltage range/V	2.5~3.8	3.0~4.3	3.0~4.35	3.5~4.3
Platform voltage/V	3.2~3.3	3.6~3.7	3.6~3.7	3.7~3.8
Cycle life/times	>1000	>1000	>500	>300
Safety performance	best	poor	better	good
Price	average	high	higher	low
High temperature performance	good	average	average	bad
Toxicity/Environmentally friendly	nontoxic	Poisonous Co	Poisonous Co	nontoxic

Dimensions and Specifications

Model No.	V	Ah 8hr to 42V 25C	Ah 1hr to 42V 25C	Max Discharge Current (A)	Width		Depth		Height		Rack Units	Weight		Terminal
					(mm)	(in.)	(mm)	(in.)	(mm)	(in.)		(kg)	(lbs.)	
48NPFC10	48	9.95	9.5	10	442	17.41	245	9.65	44	1.74	1U	7	15.4	M4
48NPFC10-2C	48	9.95	9.5	20	442	17.41	245	9.65	44	1.74	1U	7	15.4	M4
48NPFC20	48	19.9	19.0	20	442	17.41	245	9.65	88	3.47	2U	13	28.7	M4
48NPFC20-2C	48	19.9	19.0	40	442	17.41	245	9.65	88	3.47	2U	13	28.7	M4
48NPFC50	48	49.7	47.5	50	442	17.41	390	15.36	133	5.24	3U	32	70.6	M6
48NPFC80	48	79.7	76.0	80	442	17.41	401	15.8	133	5.24	3U	44	96.8	M6
48NPFC100-23	48	99.4	95.0	100	530	20.87	400	15.75	132.5	5.22	3U	45	99.2	M6
48NPFC100	48	99.4	95.0	100	443	17.42	390	15.36	225.0	8.86	5U	45	99.2	M6

BMS/Battery Operating Parameters

Parameters	Units	Value
Float charge voltage	V	54 ±0.5
Equalization charge voltage	V	NA
Nominal charge current	A	0.2C
Charge current limitation	A	0.5C ~ 1.0C
Equalization charge interval	day	NA
Equalization charge duration	H	NA
Equalization charge	A	NA
Condition to float charge	A	0.05C
LVBD (Low voltage battery disconnect)	V	> 40.5
Temperature compensation (float charge)	-mV/°C	NA
Temperature compensation (equalization charge)	-mV/°C	NA

Operating Environment Limits

Maximum Recommended Temperature Range (°C)	Discharge	-20 ~ +60
	Charge	0 ~ +60
	Storage	0 ~ +40
Recommended Temperature (°C)	Discharge	+15 ~ +35
	Charge	+15 ~ +35
	Storage	+15 ~ +30
Humidity	5% ~ 95%	

Over Temperature Protection	High temp. - charge	70±3°C
	Recover temp. - charge	60±3°C
	High temp. - discharge	70±3°C
	Recover temp. - discharge	60±3°C
	Low temp. - charge	0±3°C
	Recover temp. - charge	5±3°C
	Low temp. - discharge	-10±3°C
	Recover temp. - discharge	0±3°C



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Constant Current Discharge Rates @25C in Hours (Amps)

48NPFC10											-2C
End	10	8	5	4	3.5	2.5	2	1.5	1	0.5	
46.5V	1.0	1.2	1.9	2.4	2.6	3.5	4.2	5.2	6.9	13.3	
45.0V	1.0	1.2	2.0	2.4	2.7	3.8	4.7	6.6	8.8	16.9	
44.1V	1.0	1.2	2.0	2.5	2.8	3.9	4.8	6.8	9.0	17.4	
43.5V	1.0	1.2	2.0	2.5	2.8	3.9	4.9	7.0	9.3	17.9	
42.0V	1.0	1.3	2.0	2.5	2.8	4.0	4.9	7.1	9.5	18.3	
40.5V	1.0	1.4	2.0	2.5	2.8	4.0	5.0	7.2	9.7	18.6	

48NPFC20											-2C
End	10	8	5	4	3.5	2.5	2	1.5	1	0.5	
46.5V	1.9	2.4	3.8	4.8	5.3	7.1	8.4	10.3	13.8	24.9	
45.0V	2.0	2.4	3.9	4.9	5.5	7.7	9.4	13.2	17.6	33.2	
44.1V	2.0	2.5	3.9	4.9	5.6	7.8	9.6	13.5	18.1	34.2	
43.5V	2.0	2.5	4.0	5.0	5.6	7.8	9.7	13.9	18.6	35.1	
42.0V	2.0	2.5	4.0	5.0	5.6	7.9	9.9	14.3	19.0	36.7	
40.5V	2.0	2.5	4.0	5.0	5.7	8.0	10.0	14.5	19.3	37.2	

48NPFC50										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	4.8	6.0	9.5	11.1	11.9	17.8	21.0	27.7	34.4	
45.0V	4.9	6.1	9.7	11.3	12.1	19.1	23.5	33.7	43.9	
44.1V	4.9	6.1	9.8	11.5	12.3	19.4	23.9	34.6	45.2	
43.5V	5.0	6.2	9.9	11.6	12.4	19.6	24.3	35.4	46.4	
42.0V	5.0	6.2	9.9	11.6	12.4	19.8	24.6	36.1	47.5	
40.5V	5.0	6.3	10.0	11.7	12.5	20.0	24.9	36.6	48.2	

48NPFC80										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	7.6	9.5	15.2	17.7	19.0	28.2	33.5	44.3	55.1	
45.0V	7.6	9.8	15.5	18.1	19.4	30.6	37.6	53.9	70.2	
44.1V	7.7	9.8	15.7	18.3	19.7	31.0	38.3	55.3	72.2	
43.5V	7.9	9.9	15.8	18.5	19.9	31.3	38.9	56.6	74.3	
42.0V	7.9	10.0	15.9	18.6	19.9	31.7	39.4	57.7	76.0	
40.5V	8.0	10.0	16.0	18.7	20.0	32.0	39.8	58.5	77.1	

48NPFC100										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	9.6	12.0	19.0	22.2	23.8	35.6	42.0	55.4	68.8	
45.0V	9.8	12.2	19.4	22.6	24.2	38.2	47.0	67.4	87.8	
44.1V	9.8	12.2	19.6	23.0	24.6	38.8	47.8	69.2	90.4	
43.5V	10.0	12.4	19.8	23.2	24.8	39.2	48.6	70.8	92.8	
42.0V	10.0	12.4	19.8	23.2	24.8	39.6	49.2	72.2	95.0	
40.5V	10.0	12.6	20.0	23.4	25.0	40.0	49.8	73.2	96.4	

Constant Power Discharge Rates @25C in Hours (Watts)

48NPFC10											-2C
End	10	8	5	4	3.5	2.5	2	1.5	1	0.5	
46.5V	49.0	60.0	96	122	135	131	220	283	387	529	
45.0V	49.9	61.4	98	125	138	136	233	307	445	647	
44.1V	50.2	61.8	99	126	139	137	236	310	453	662	
43.5V	50.5	62.1	99	127	140	138	238	312	459	675	
42.0V	50.9	62.5	100	128	141	139	240	317	467	687	
40.5V	51.1	62.9	101	128	142	140	242	320	470	689	

48NPFC20											-2C
End	10	8	5	4	3.5	2.5	2	1.5	1	0.5h	
46.5V	98	120	192	244	270	262	440	566	774	1058	
45.0V	100	123	196	250	277	273	467	614	891	1294	
44.1V	101	124	198	252	279	275	472	619	906	1324	
43.5V	101	124	199	253	280	276	477	624	918	1349	
42.0V	102	125	200	255	282	279	480	635	934	1373	
40.5V	102	126	201	256	284	280	484	640	939	1377	

48NPFC50										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	245	300	480	610	675	655	1100	1414	1934	
45.0V	250	307	491	625	692	682	1167	1534	2227	
44.1V	251	309	494	629	696	686	1181	1549	2264	
43.5V	252	311	497	633	700	690	1192	1561	2294	
42.0V	254	313	500	637	706	697	1200	1587	2334	
40.5V	255	314	503	640	709	701	1209	1601	2348	

48NPFC80										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	392	480	768	976	1079	1049	1761	2262	3094	
45.0V	399	491	785	1000	1107	1091	1867	2454	3564	
44.1V	402	494	791	1007	1114	1098	1889	2478	3623	
43.5V	404	497	795	1012	1120	1104	1907	2497	3671	
42.0V	407	500	800	1020	1130	1116	1921	2540	3735	
40.5V	409	503	805	1024	1134	1122	1934	2561	3756	

48NPFC100										
End	10	8	5	4	3.5	2.5	2	1.5	1	
46.5V	490	600	960	1220	1350	1310	2200	2828	3868	
45.0V	500	614	982	1250	1384	1364	2334	3068	4454	
44.1V	502	618	988	1258	1392	1372	2362	3098	4528	
43.5V	504	622	994	1266	1400	1380	2384	3122	4588	
42.0V	508	626	1000	1274	1412	1394	2400	3174	4668	
40.5V	510	628	1006	1280	1418	1402	2418	3202	4696	

NPFC-Series Li-Ion LiFePO₄

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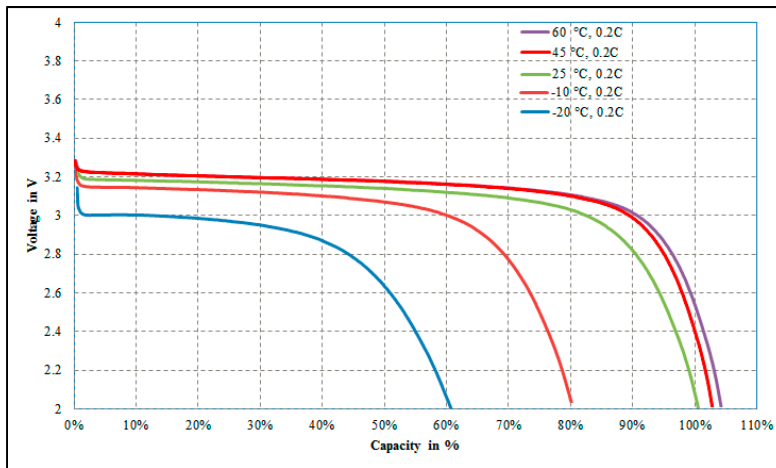
Cycles - Temperature vs. Depth of Discharge

Temp (°C)	Depth of Discharge (DoD)				
	100%	80%	60%	40%	20%
25	2000	3500	6000	12000	24000
35	1600	2800	4800	9600	19200
45	1200	2100	3600	7200	14400



48V
10 x 48NPFC50 modules
Outdoor Enclosure

Discharge - Temperature vs. Percent Capacity %



50Ah, 80Ah & 100Ah Module Height and Capacity Specifications 1-16 Modules

Model	1		2		3		4		5		6		7		8	
	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)
48NPFC50	49.7	5.25	99.4	10.5	149.1	15.75	198.8	21	248.5	26.25	298.2	31.5	347.9	36.75	397.6	42
48NPFC80	79.7	8.75	159.4	17.5	239.1	26.25	318.8	35	398.5	43.75	478.2	52.5	557.9	61.25	637.6	70
48NPFC100	99.4	5.25	198.8	10.5	298.2	15.75	397.6	21	496.4	26.25	596.4	31.5	695.8	36.75	795.2	42

Model	9		10		11		12		13		14		15		16	
	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)
48NPFC50	447.3	47.25	497	52.5	546.7	57.75	596.4	63	646.1	68.25	695.8	73.5	745.5	78.75	795.2	84
48NPFC80	717.3	78.75	797	87.5	876.7	96.25	956.4	105	1036.1	113.75	1115.8	122.5	1195.5	131.25	1275.2	140
48NPFC100	894.6	47.25	994	52.5	1093.4	57.75	1192.8	63	1292.2	68.25	1391.6	73.5	1491	78.75	1590.4	84

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