Stored energy solutions for a demanding world

Model: 48NPFC100 NPFC Series

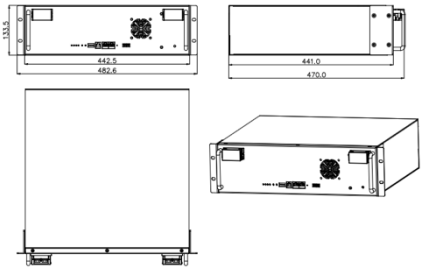
Narada NPFC series is a complete range of 48V LiFePO4 (Lithium Iron Phosphate) battery products, for a wide variety of applications, such as telecom base station, UPS, renewable energy system, etc., with advanced life, standard size, light weight and strong environmental adaptability.

Battery Management System (BMS)

For standard Narada lithium battery module, BMS is applied to monitor voltage, current, temperature of cells and module, take protections against over-charge, over-discharge, over-current, over-temperature, under- temperature and short circuit, etc., and provide cell balancing and current limitation during charging process to ensure a reliable safety and excellent performance.

Meantime, Narada supply customized upper computer software for BMS communication via RS485 to set parameters or read monitoring data.

Dimensions



Specifications		
1. Nominal Voltage		48 VDC
2. Nominal Capacity (@25°C, 0.5C)		100 Ah (0.5C to 40.5V @25°C)
3. Number of Cell		15 cells
4. Battery Weight (Approximate)		Approx. 40 Kg
5. Dimensions (W*D*H)	Width * Depth * Height	Approx. 482,5mm*441mm*133.5mm
6. Energy	Normal energy (@25°C, 0.5C)	4800 Wh
	Volumetric energy density	204 Wh/L
	Gravimetric energy density	126 Wh/kg
7. Cell	Technology/material	LFP
	Cell model	FE100A
	Cell voltage (Nominal)	3.2 V
	Cell capacity (Nominal)	100 Ah
	Gravimetric energy density of cell	160 Wh/kg
8. Internal Impedance @25°C		≤ 20 mΩ
9. Standard Discharge @25°C	Max. constant current	100 A
	Cut-off voltage	40.5 VDC
10. Standard Charge @25°C	Charging Voltage Limited	54±0.5 VDC
	Max. constant current	100 A
	Recommended charging current and time	20 A (0.2C) for 5.2 hours
11. Discharge/Charge efficiency in Wh (Round trip efficiency) at 0.2C		≥ 95%
12. Self-discharge rate @25°C		≤ 3%Crt/ month
13. Cell consistency	Deviation from the maximum capacity, minimum capacity, to the average capacity of all cells when fully charged	Less than ± 1%
	Deviation from the maximum IR (internal resistance), minimum IR, to the average IR of all cells when fully charged	Less than ± 15%
	The voltage difference between the highest and lowest cells when the battery is fully charged	≤ 0.05V
	The voltage difference between the highest and lowest cells during discharge @ 100% DOD & 0.2C	≤ 0.3V
14. Design Life @25°C		≥ 12 years

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15. Operating Temperature	Charging: 0°C ~ 60°C
	Discharging: -20°C ~ 60°C
16. Storage Temperature	Recomm range: 0°C ~ 40°C
17. Operating Humidity (@40±2°C, %RH)	5% ~ 95%
18. Increment of temperature after 5 continuous charge/discharge cycles @0.5C, 50˚C	≤ 20˚C
19. Ingress Protection (IP)	20
20. Certification	UL1973, UN38.3, CE-EMC

BMS Parameters

No.	Type		Function	Setting Value	Remarks
				48NPFC100	
1	Voltage	Charge	Cell Voltage Protection	3.5V Alarm/3.6V Protection	Recover at 3.35V
2			Total Voltage Protection	56V Alarm/57V Protection	Recover at 50.2V
3		Discharge	Cell Voltage Protection	2.7V Alarm/2.6V Protection	Recover at 2.9V
4			Total Voltage Protection	43.2V Alarm/42V Protection	Recover at 45V
5	Current	Charge	Normal	≤100A	
6		Discharge	Normal	≤100A	
7			Over Current Protection 1	Alarm＞100A /	Delay 20s, recovery in
				Protection＞105A	every 10min
			Over Current Protection 2	＞65A and ＜100A	Delay 3s, recovery in every 10min
8			Short Circuit Protection	≥200A	Delay 300μs
9	Temp	Cell Temp	Low temp protection	Charging ＜ - 10°C	Delay 1~2s
				Discharging ＜ - 25°C	
10			High temp protection	Charging: Alarm＞65°C / 70°C Protection	Delay 1~2s
				Discharging: Alarm＞65°C / 70°C Protection	
11		PCB	High temp protection	Alarm＞90°C / ＞115°C Protection	Recovery at 85°C
12	Cell Balance	Balance	Make all cells be balance during charging process	V_{Max} ≥ 3.40V and $V_{Max.}$ - V_{Min} ≥ 30mV, start balance	All cell voltages ＜3.4V or $V_{Max.}$-V_{Min} ≤30mV, or discharge stop balance
			Current: 150mA		

Layout of Front Panel		
1	Status Indicators by LED	SOC / ALM / RUN
2	Communication Ports	RS485*2, RJ45*1
3	Communication in Parallel	16 modules in maximum (same vendor) 3 out of 10 modules in maximum (different vendor, same SOH)
4	Reset Key	Available
5	Terminal Size	2M8 (Screw size)
6	Dry Contact	Available (4 contacts)

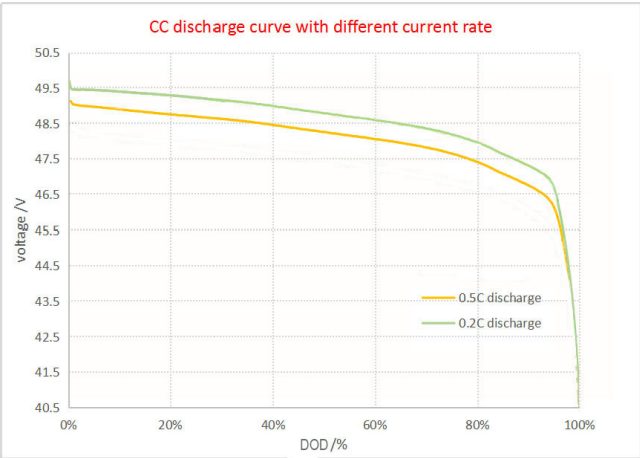
Constant Current Discharge Characteristics (25°C,77°F)

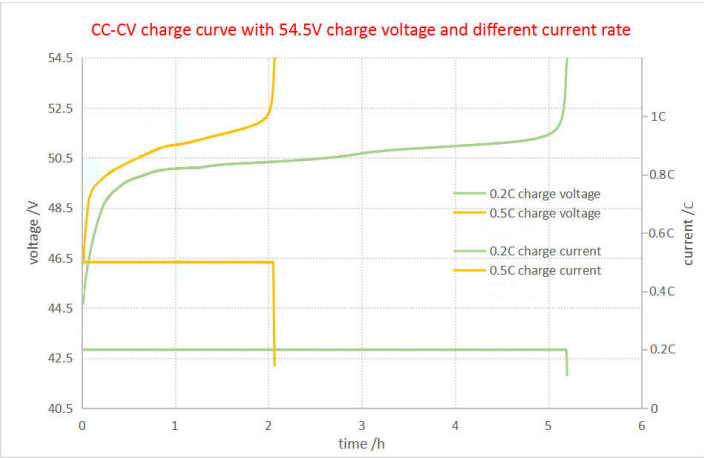
Current(A)	0.1C	0.2C	0.35C	0.5C	0.6C	0.8C	1C
End voltage - Time	Hours						
46.5V	9.73	4.85	2.93	1.90	1.43	1.15	0.90
45.0V	9.92	4.96	3.00	1.96	1.52	1.20	0.93
43.5V	10.05	5.03	3.05	2.00	1.55	1.23	0.96
42.0V	10.13	5.07	3.08	2.02	1.58	1.25	0.98
40.5V	10.18	5.10	3.09	2.03	1.63	1.26	1.00

Discharge Data with Constant Power (25°C,77°F)

Current(A)	480W	960W	1580W	2400W	2880W	3800W	4800W
End voltage - Time	Hours						
46.5V	9.83	4.89	2.92	1.85	1.43	1.05	0.90
45.0V	10.02	4.99	3.01	1.91	1.52	1.11	0.93
43.5V	10.13	5.05	3.05	1.95	1.55	1.15	0.96
42.0V	10.21	5.09	3.08	1.98	1.58	1.18	0.98
40.5V	10.25	5.12	3.09	2.00	1.63	1.20	1.00

Performance Curves





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All the data in datasheet is valid for single module operation. For parallel operation please ask Narada technical for guidelines.

Any datasheet issued previously is invalid when new version releases.

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