Stored energy solutions for a demanding world

Model: 48NPFC200 NPFC Series

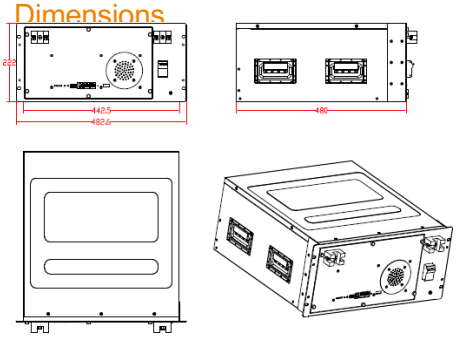
Narada NPFC series is a complete range of 48V $LiFePO_4$ (Lithium Iron Phosphate) battery products, for a wide variety of applications, such as telecom base station, UPS, renewable energy system, etc., with advanced life, standard size, light weight and strong environmental adaptability.

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		
Nominal Voltage		48 VDC
Nominal Capacity (@25°C, 0.5C)		200 Ah (0.5C to 40.5V @25°C)
Number of Cell		2P15S (2 groups of 15 cells)
Battery Weight (Approximate)		Approx. 76 Kg
Dimensions (W*D*H)	Width * Depth * Height	(442,5mm*480mm*222mm)
Energy	Normal energy (@25°C, 0.5C)	9600 Wh
	Volumetric energy density	204 Wh/L
	Gravimetric energy density	126 Wh/kg
Cell	Cell model	FE100A
	Cell voltage (Nominal)	3.2 V
	Cell capacity (Nominal)	100 Ah
	Gravimetric energy density of cell	160 Wh/kg
Internal Impedance @25°C		≤ 20 mΩ
Standard Discharge @25°C	Max. constant current	100 A
	Cut-off voltage	40.5 V
Standard Charge @25°C	Charging Voltage Limited	54±0.5 V
	Max. constant current	100 A
	Recommended charging current and time	40 A (0.2C) for 5.2 hours
Discharge/Charge efficiency in Wh (Round trip efficiency) at 0.2C		≥ 95%
Self-discharge rate @25°C		≤ 3%Crt/ month
Cell consistency	Deviation from the maximum capacity, minimum capacity, to the average capacity of all cells when fully charged	Less than ± 1%
	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
Design Life @25°C		≥ 12 years
Cycle Life (@25°C, 0.2C)		4,000 cycles @ 80% DOD
Operating Temperature		Charging: 0°C ~ 60°C
		Discharging: -20°C ~ 60°C

Storage Temperature	Recommended range: 0°C ~ 40°C
Operating Humidity (@40±2°C, %RH)	5% ~ 95%
Certification	UL1973, UN38.3, CE-EMC

BMS Parameters

No.	Type		Function	Setting Value 48NPFC200	Remarks
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	＞125A and ＜200A	Delay 3s, recovery in every 10min
8			Short Circuit Protection	≥400A	Delay 300uS
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℃
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	SOC / ALM / RUN
2	Communication Ports	RS485*2
3	Communication in Parallel	8 modules in maximum
4	Reset Key	Available
5	Terminal Size	2M6 (Screw size)
8	Dry Contact	Optional

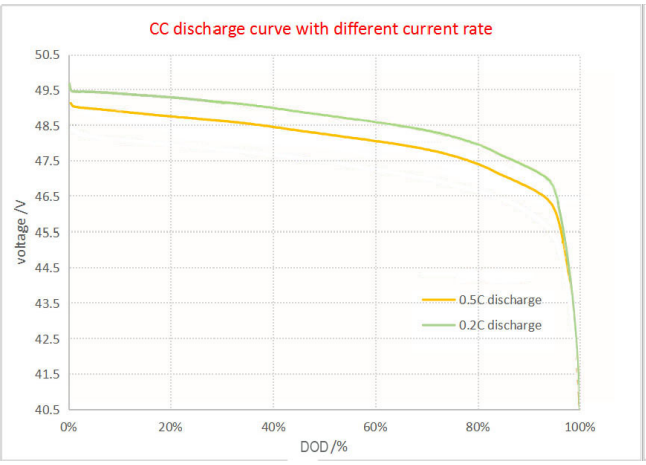
Constant Current Discharge Characteristics (25°C,77°F)

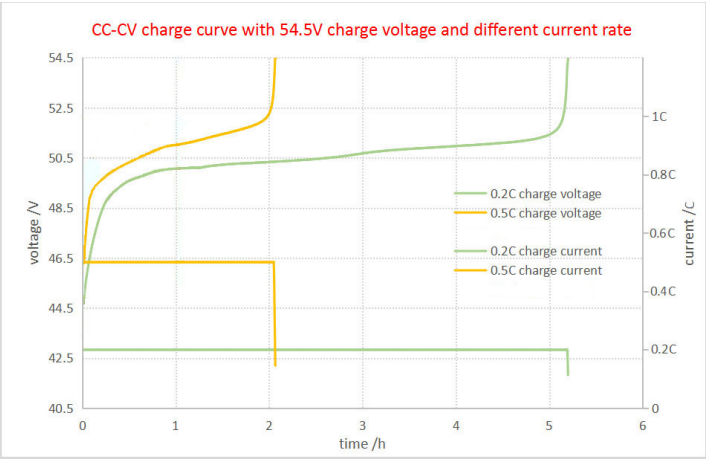
Current(A)	0.1C	0.2C	0.35C	0.5C	0.6C	0.8C	1C
End voltage - Time	Hours						
46.5V	9.73	4.85	2.93	1.88	1.43	1.01	1.00
45.0V	9.92	4.96	3.00	1.96	1.52	1.13	1.10
43.5V	10.05	5.03	3.05	2.00	1.55	1.18	1.15
42.0V	10.13	5.07	3.08	2.01	1.58	1.20	1.17
40.5V	10.18	5.10	3.09	2.03	1.63	1.30	1.25

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

Power	900W	1800W	2700W	3600W	4500W	5400W	6300W	9600W
End voltage - Time	Hours							
46.5V	9.73	4.85	2.93	1.88	1.43	1.21	1.01	1.00
45.0V	9.92	4.96	3.00	1.96	1.52	1.32	1.13	1.10
43.5V	10.05	5.03	3.05	2.00	1.55	1.35	1.18	1.15
42.0V	10.13	5.07	3.08	2.01	1.58	1.38	1.20	1.17
40.5V	10.18	5.10	3.09	2.03	1.63	1.41	1.30	1.25

Performance Curves





Disclaimers of warranties:

The information in this document may contain predictive statements including, without limitation, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements.

No portion of the information or documents may be reproduced in any form or by any means without the prior written consent of Narada.
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.