Narada®

An Expert of Energy Storage Solutions.

Narada lithium storage

With technology of LFP cells

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High voltage solution

Narada lithium cell

Brief introduction

Narada NLC series of lithium-ion cell

Narada NLC series cell are made by LFP ($LiFePO_4$) and NMC ($LiNiMnCoO_2$) technologies, available in both pouch and prismatic forms with light weight, stable performance and high energy density

Cell family of Narada NLC series

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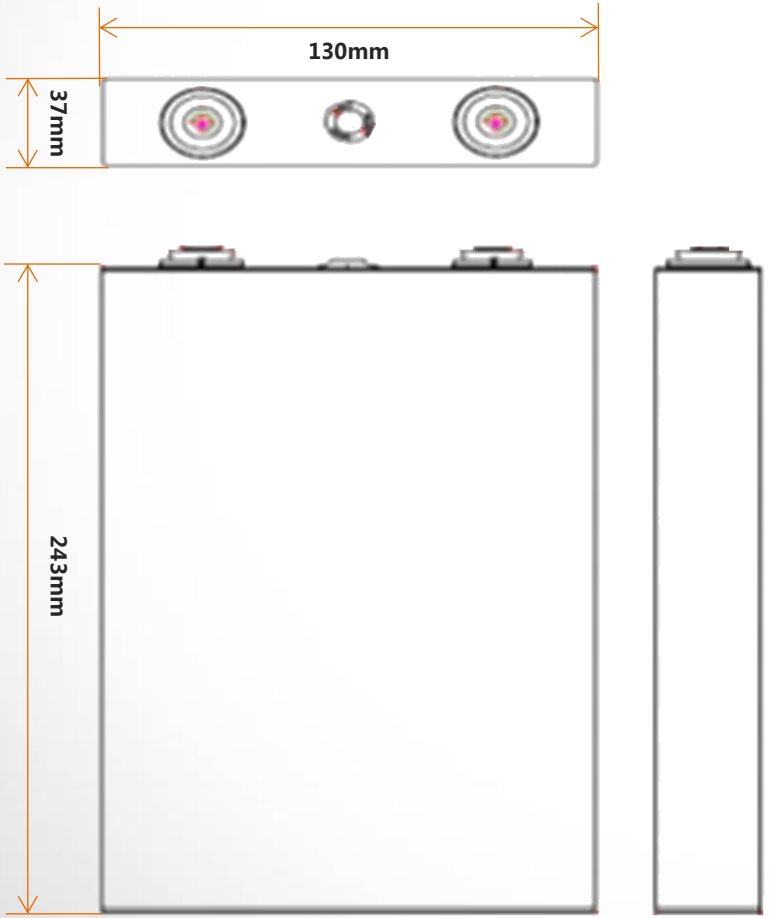
Narada lithium cell

Dimension of prismatic cell



NLC36130255PF

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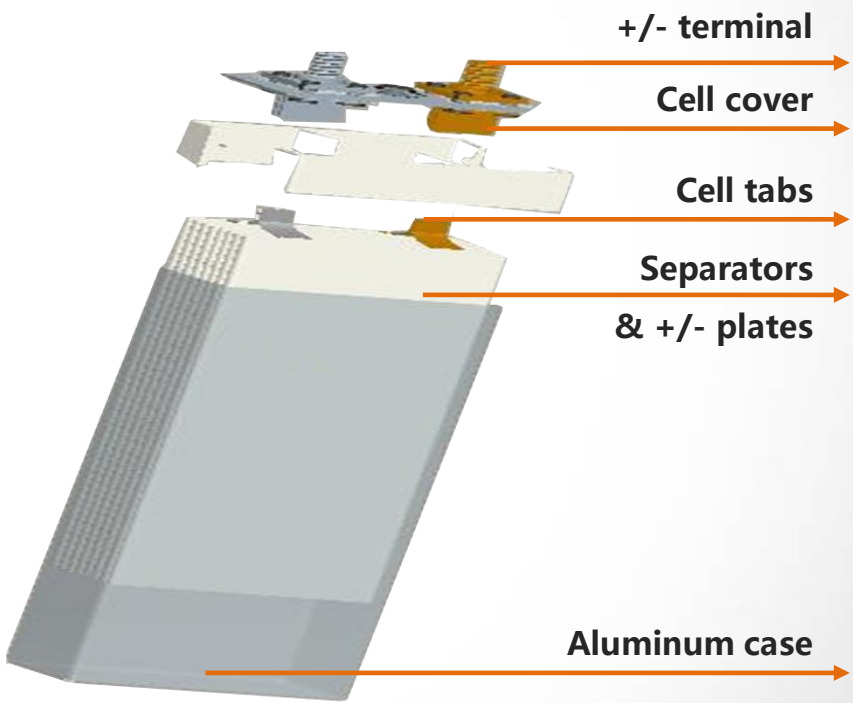
Narada lithium cell

Specification of NLC cell

Model	NLC36130255PF
Rated voltage	3.2V
Rated capacity	80Ah
Discharge current	240A (Continuous)
Charge current	80A (Standard)
Discharge current	80A (Standard)
Charge current	160A (Maximum)
Charge voltage	3.65V (Limit)
Cut-off voltage	2.5V
Impedance	≤ 1.0mΩ
Length of cell	130.0mm
Width of cell	37.0mm
Height of cell	243.0mm



Exploded view of NLC cell

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NESP lithium module

NESP housing

+

Narada NLC cell

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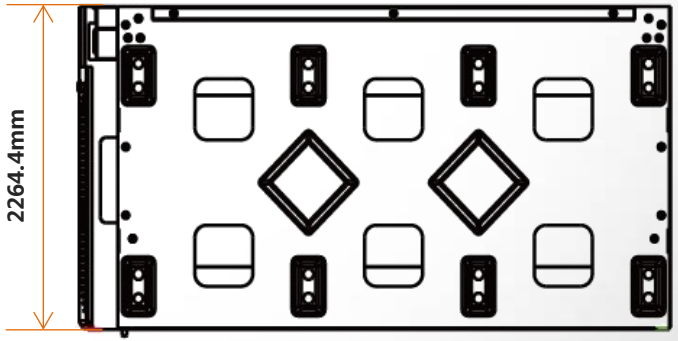
NESP module

Dimension of module



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NESP lithium module

Specification of module

Model	19NESP160	38NESP80
Rated voltage	19.2V	38.4V
Rated capacity	160Ah	80Ah
Cell connection	6*2strings	12*1string
Dimension	510.0*181.6*264.4mm	
Weight	35kg	
Temperature range	Discharge: -20 to +60°C Charge: 0 to +60°C Storage: 0 to +40°C	
Recommended temperature	Discharge: +15 to +35°C Charge: +15 to +35°C Storage: +15 to +30°C	
Humidity	5% to 95%	

Modules connection in system

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NESP storage system

System introduction

Whole integrated storage system with both lithium modules and BMS, quite convenient in both maintenance and installation, extendable to large scale

- **Customized system with flexibility**
- **Wide range of voltage and capacity**
- **Modular design for easy installation**
- **Integrated with battery management**

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NESP storage system

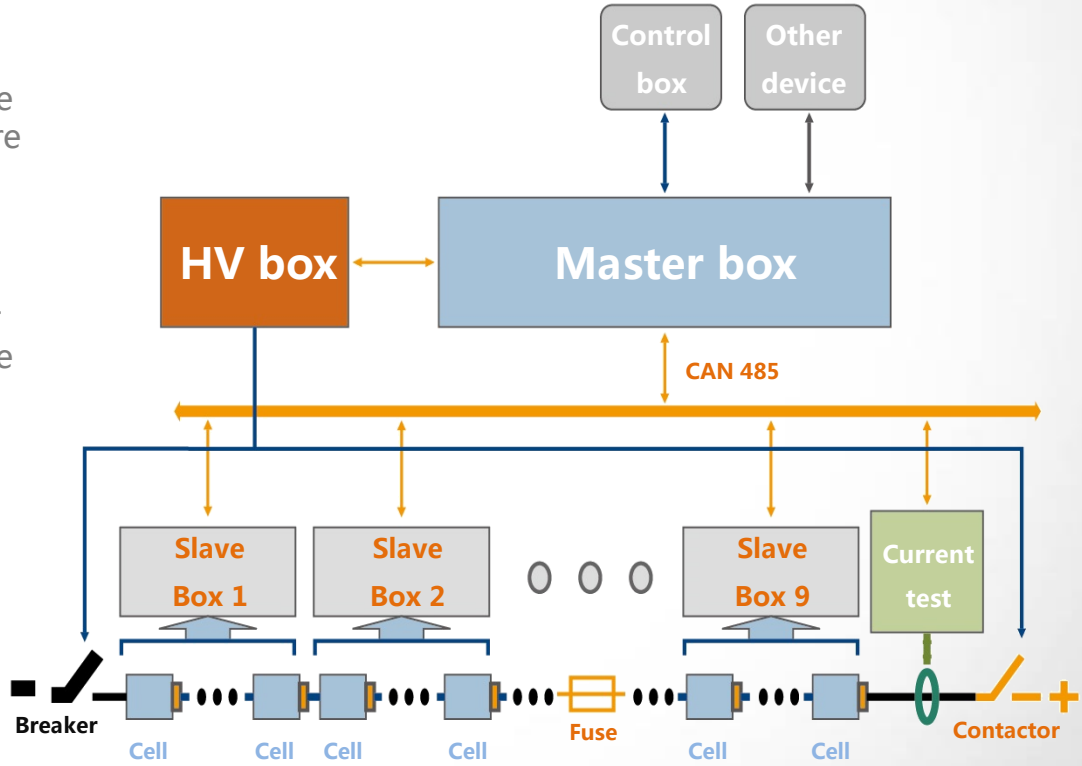
Function and diagram of BMS

Principal function

- **System protection:**
  - Over or under temperature & voltage
  - Short circuit or communication failure
  - Over current of charge or discharge
- **Data acquisition:**
  - Cell voltage and temperature
  - Cumulative charge/ discharge power
  - Current & capacity of battery module
- **Cell balancing**
- **SOC & communication**

Optional function

- **LCD display interface**
- **EEROM for data storage**
- **Current limit setup: 2A~25A**



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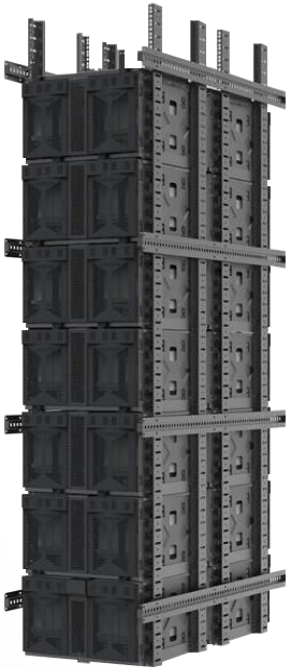
NESP storage system

System configuration

NESP

+

BMS



Racks

Cabinet

Storage system

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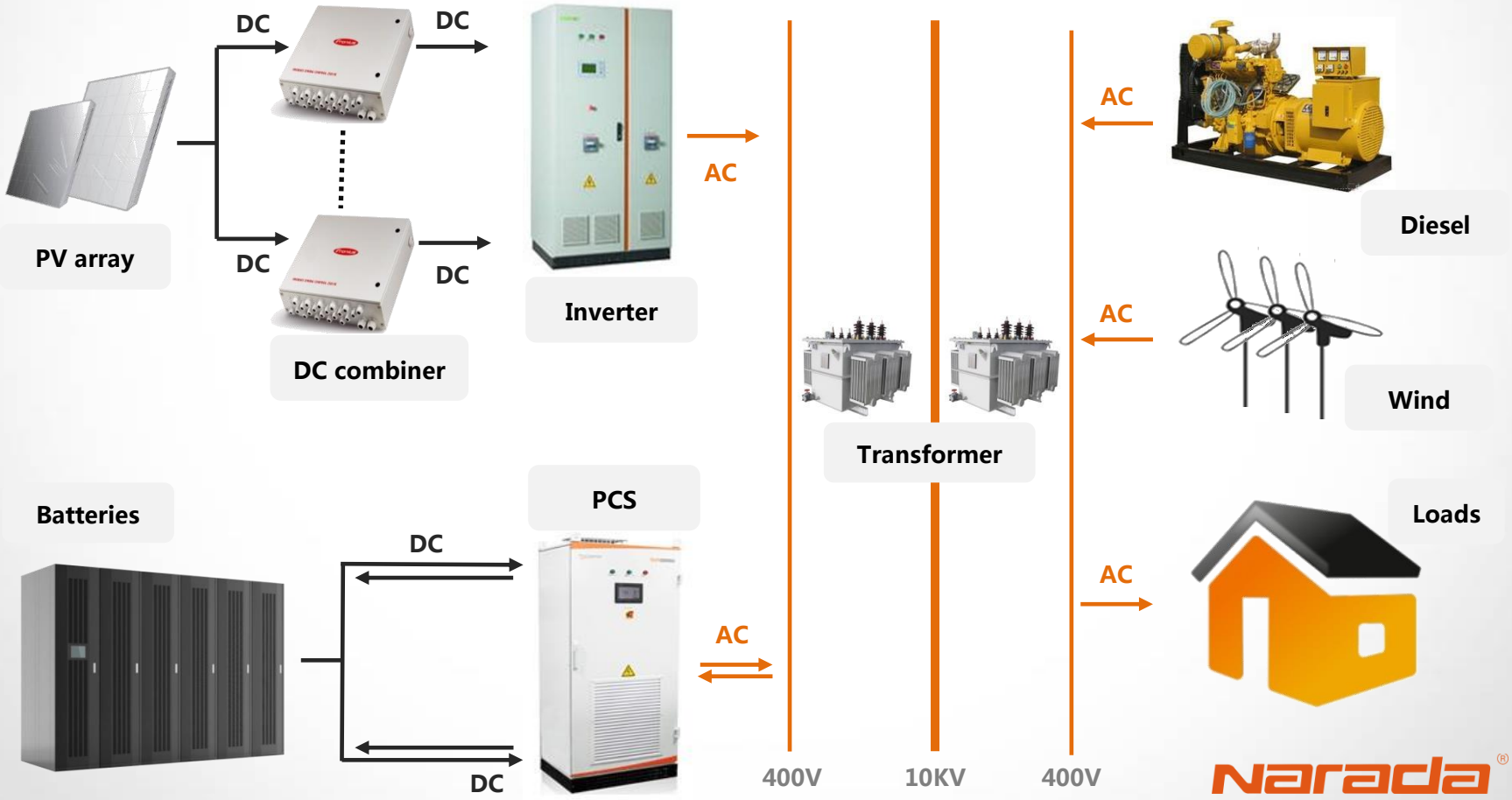
NESP storage system

Commercial system composition



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Low voltage solution

NPFC lithium module

General introduction

Narada 48NPFC series

Made of LiFePO4 (lithium iron phosphate) cells with 48V integrated with smart BMS for remote monitoring as well as maintenance, suitable for many applications of energy storage

- **No active cooling units required**
- **Compact, space saving for cabinet**
- **Easier site planning and installation**
- **More safety and operational reliability**
- **High efficiency and longer service life**

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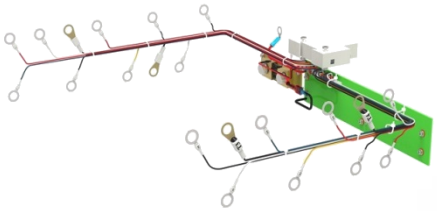
NPFC lithium module

System composition



- Battery cell group
- Connection system
- Protection system
- BMS system

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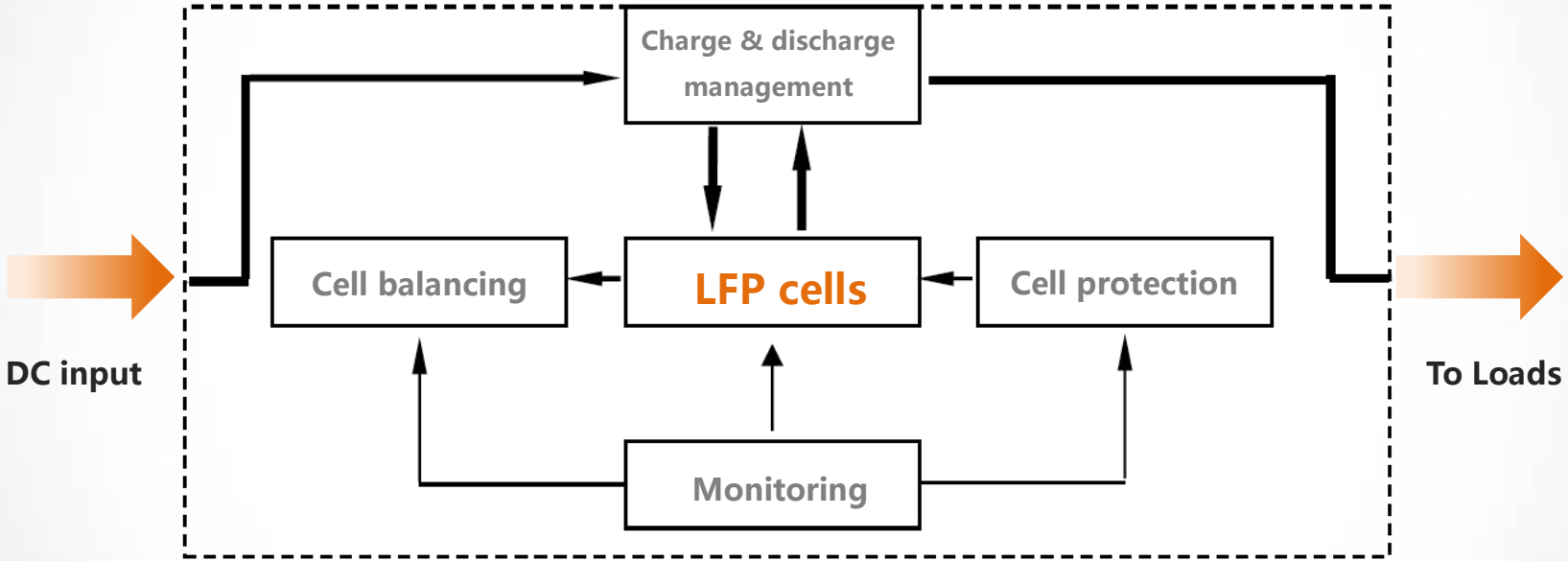
NPFC lithium module

Schematic diagram



- **LFP cell:** Chemical power source, for energy storage and power supply
- **Monitoring:** Optional component according to requirement from clients
- **Ch. & disch. management:** Current limit for charge & discharge circuit
- **Cell protection:** Against short-circuit, over-charge, over-current…etc.
- **Cell balancing:** System equalization to those unbalanced LFP cell

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NPFC lithium module

Interface of front panel

2*RS485

RS232

ADD switch

ALM & Run

SOC light

Louver

Terminal

Handel

Maintenance

Reset

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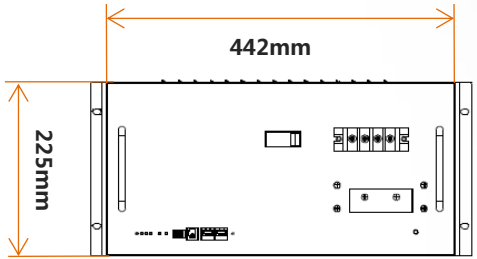
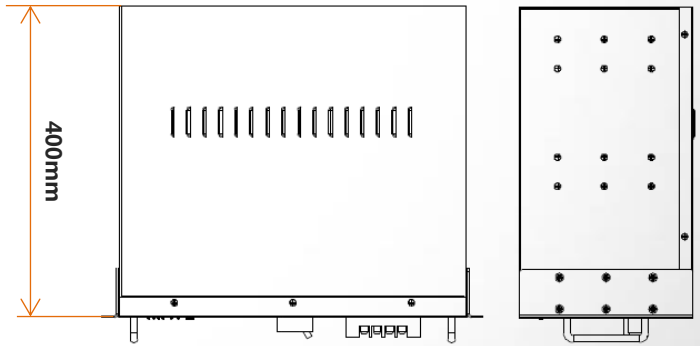
NPFC lithium module

Module 48NPFC80

48NPFC80





Specification	Value
Rated capacity (at 25 ℃)	80Ah(C_5)
Recommended charge current	16A
Max. charge/discharge current	80A
Charge voltage/End voltage	54±0.5V/40.5V
Weight	44kg

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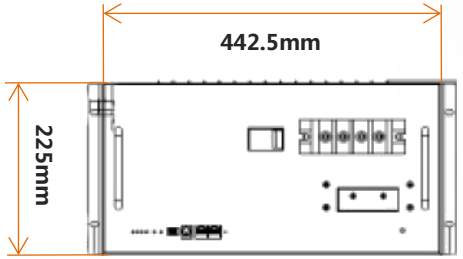
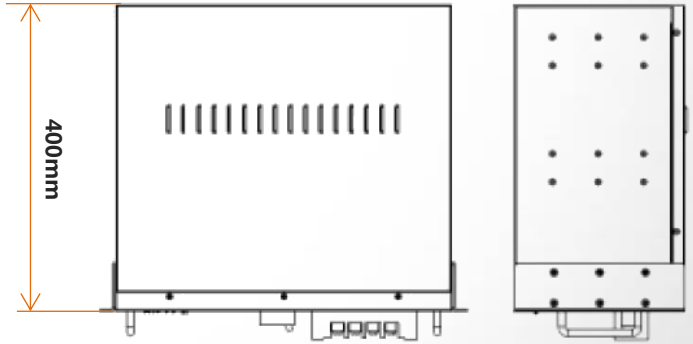
NPFC lithium module

Module 48NPFC100





48NPFC100

Specification	Value
Rated capacity (at 25 ℃)	100Ah(C_5)
Recommended charge current	20A
Max. charge/discharge current	100A
Charge voltage/End voltage	54±0.5V/40.5V
Weight	45kg

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NPFC storage system

Separated storage cabinet

A completed storage solution, consists of NPFC modules, monitoring platform, connection box, as well as EMS, ideally for general requirement

- **Automatic** operational mode
- **Smart App** for remote monitoring
- **Optimize** profit of PV system

- **Modular** design for flexible setup
- **Plug & Play** for easier installation
- **Compatible** with most of inverters

- **5 years** product warranty
- **7 years** performance warranty
- **15 years** expected service life

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Stored Energy Solutions for a Demanding World!

NPFC storage system

Solar inverter

Compatible with most type of both battery inverter and hybrid inverter

EMS & connection

Real-time system regulation for energy balance and economics

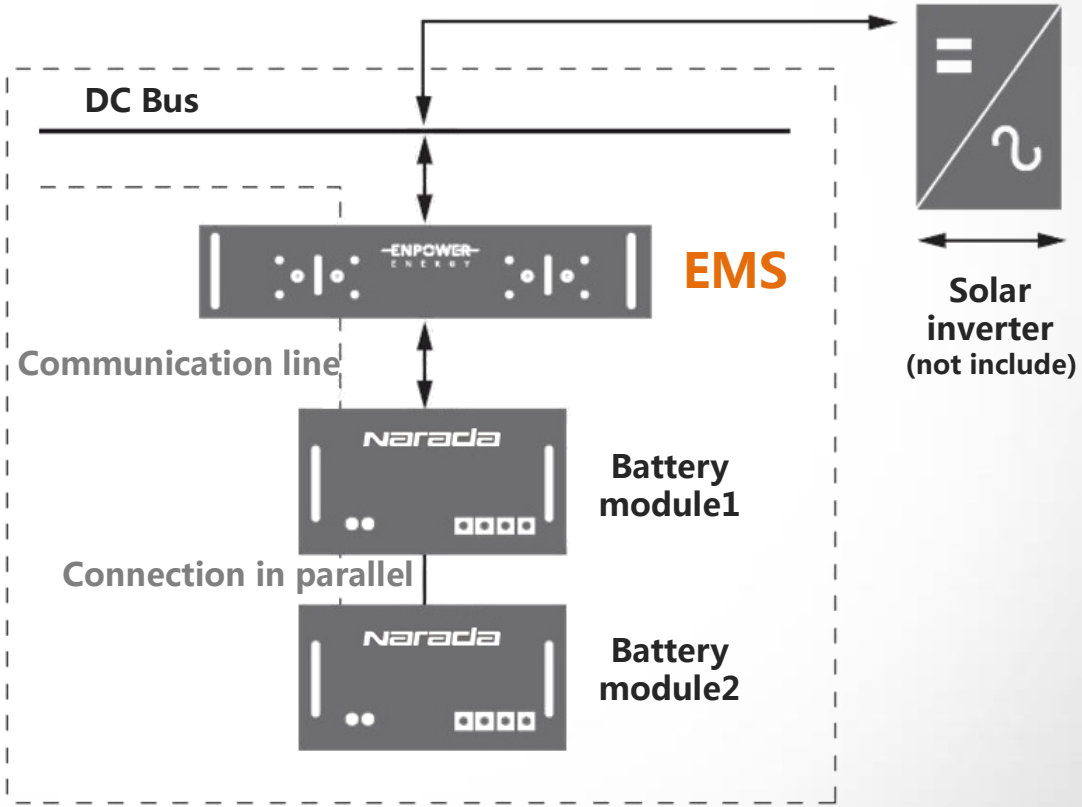
Battery modules

Installed with two modules of 48NPFC80 lithium-ion batteries

Monitoring

Remote data monitoring for both laptop and mobile telecom devices

Composition of cabinet



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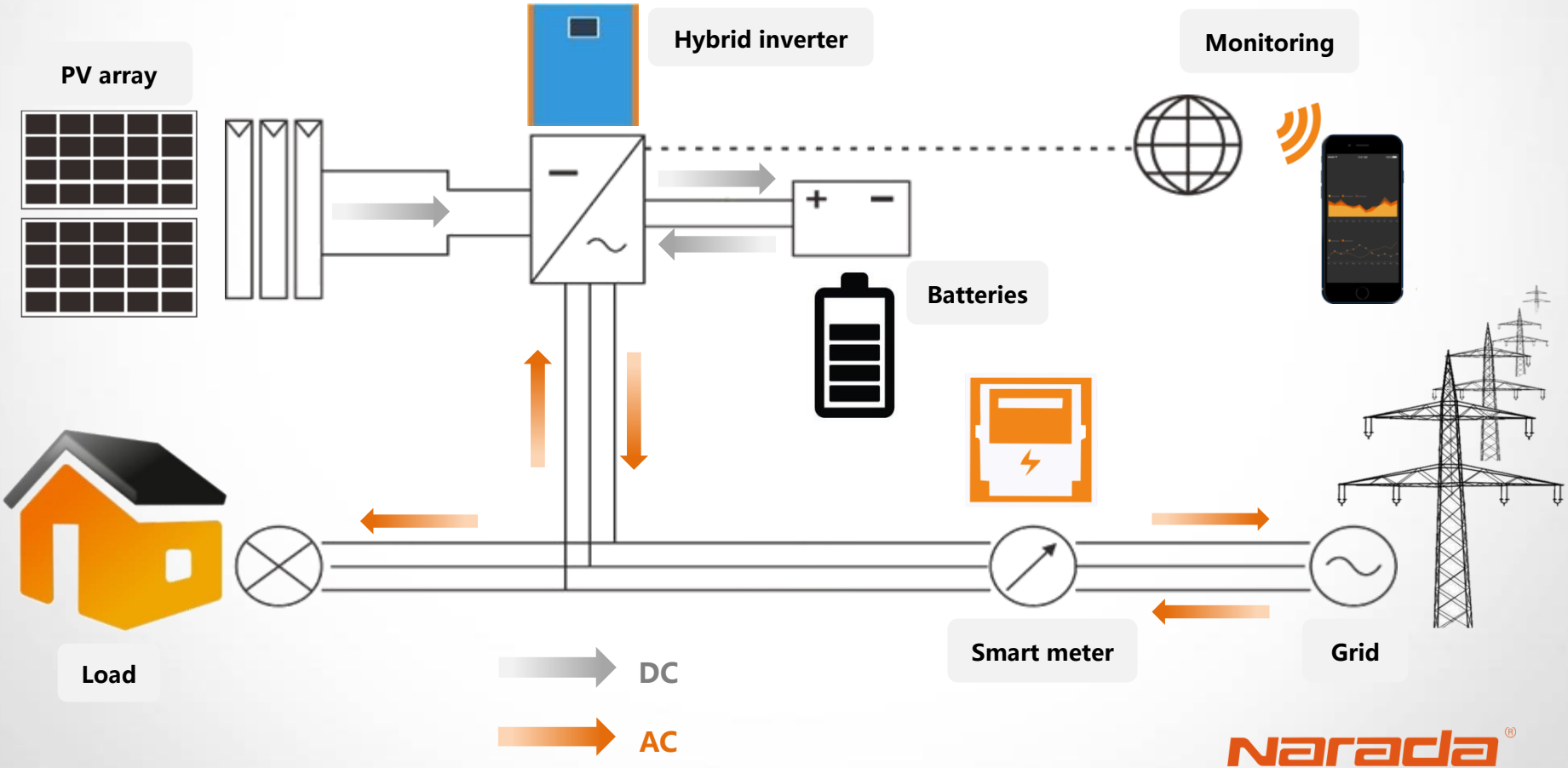
NPFC storage system

Cabinet specification

Parameters	Description	
Input (AC-Utility grid)	Rated input AC voltage	220-240V@1-Phase or 400V@3-Phase
	AC frequency	50 Hz/60 Hz
	Max. line current	60 A
Input (AC-PV interface)	Rated input AC voltage	220-240V@1-Phase or 400V@3-Phase
	AC frequency	50 Hz/60 Hz
	Max. line current	60 A
Output (AC-normal load)	Rated output AC voltage	220-240V@1-Phase or 400V@3-Phase
	AC frequency	50 Hz/60 Hz
	Max. line current	60 A
Output (AC-UPS load)	Rated output AC voltage	220V/230V/240V@1-Phase
	AC frequency	50 Hz/60 Hz
	Continuous power@25℃	3500 VA
	Power 30 min. / 5 sec. @25℃	4000 VA / 10.5 kVA
	Power factor	0.1~1

NPFC storage system

Residential system composition



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NPFC storage system

Monitoring system

Functions of monitoring

- Data generation, storage, consumption
- Warning & analysis for system failure
- Both real-time and historical records
- Flexible demonstration by any time
- Available for both IOS and Android

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NPFC storage system

Integrated storage cabinet

An integrated system, consists with Narada NPFC modules, inverter, monitoring platform, EMS and connection box, ideally for high-end requirement

- **Automatic** operational mode
- **One-stop** integrated solution
- **Smart** energy management

- **Modular** design for maintenance
- **Plug & Play** for easier installation
- **Available** for many other inverters

- **5 years** product warranty
- **7 years** performance warranty
- **15 years** expected service life

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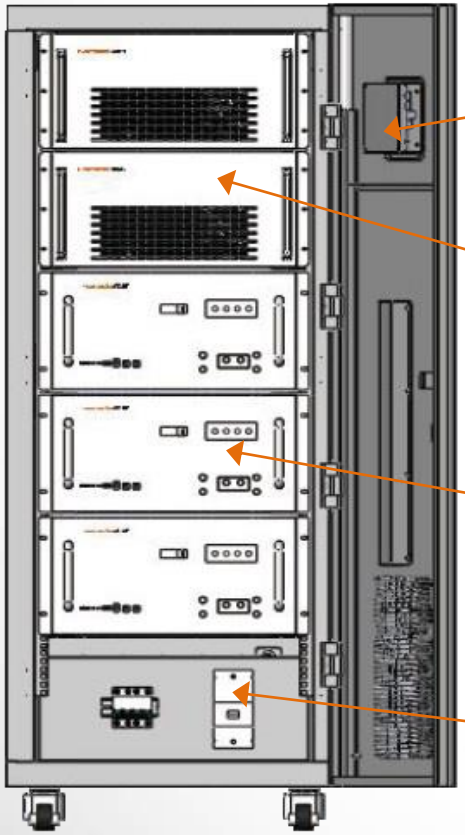
NPFC storage system

Composition of cabinet

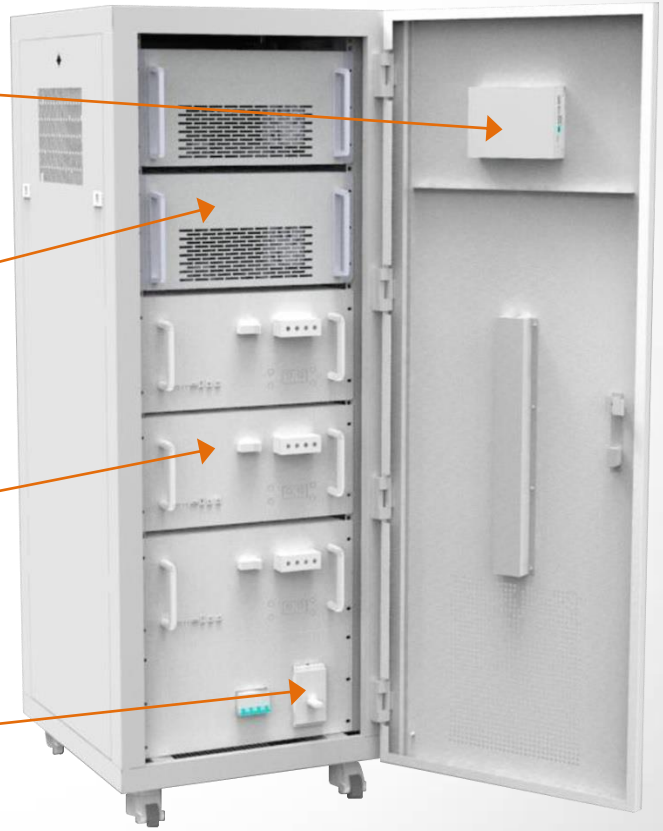


EMS module

Inverter modules

Battery modules

System switch



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NPFC storage system

Cabinet specification

Parameter	3KW/11.5KWh	6KW/11.5KWh
Dimensions (W*D*H)	600*700*1600mm	
System weight	<280 Kg	<300 Kg
Nominal/Available capacity	11.5KWh / 9.21KWh (@ 80% DOD)	
Operating voltage range	48V (@[40,100])	
Maximum charging power	3.0KW	6.0KW
Maximum charging current	60A / 45A	120A / 90A
Charge/Discharge efficiency	93.5%	
Grid feed-in	3N ~ 400V	
Inverter certification	VDE-AR-N4105 / IEC62109 / VDE0126 / CE	
Battery configuration	3pcs of 48V80Ah modules in parallel	
Battery lifespan	>5000 times (@ 80% DOD)	
Battery certification	CE / UN 38.3	
Energy management system	9 inch touch screen with full color	
Communication access	RS485 / RS232 / USB / Ethernet / WiFi	

NPFC storage system

Operational modes

Under normal grid condition

Daytime:

Loads firstly get PV energy, whose rest will be stored in cabinet, and residue into grid

At night:

Loads firstly get energy from battery, then from grid if storage capacity is not enough

Under abnormal grid condition

On-grid to off-grid:

System will automatically switch to off-grid mode for vital loads when grid is abnormal

Off-grid to on-grid:

System will switch back automatically from off-grid to on-grid mode when grid normal

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NPFC storage system

Specialty of integrated cabinet

More options of appearance available

System Highlights

- Compact and one-stop integration
- Smart management for more profit
- Auto-switch for on & off grid mode
- Long lifespan with >7years warranty
- Touchable screen for local monitoring

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NPFC storage system

More cabinet reference

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Projects of power storage

Energy storage project for Grid India

Katwaria Sarai, New Delhi, India

Project highlights

The first oversea project of energy storage, which consists of both Narada lead-carbon battery and lithium battery

- Storage capacity: **1MWh**
- Pb-C batteries: **500KWh**
- Li-ion batteries: **500KWh**
- Function: **Frequency modulation**
- Project date: **2016.08**

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Stored Energy Solutions for a Demanding World!

Energy storage project for Grid India

Katwaria Sarai, New Delhi, India

More references

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Storage project for premier school

Peshawar, Pakistan

Project Details

- Storage power: **30KWp**
- Storage capacity: **84KWh**
- Battery type: **NLC36130255PF**
- Battery quantity: **324pcs**
- Project date: **2016.11**

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Storage project for premier school

Peshawar, Pakistan

More references

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Storage project for grid distribution

Xuzhou city, Jiangsu, China

Project Details

- Storage power: **300KWp**
- Storage capacity: **344KWh**
- Battery type: **NLC36130255PF**
- Battery quantity: **1344pcs**
- Project date: **2016.12**

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Storage project for grid distribution

Xuzhou city, Jiangsu, China

More references

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Residential solution of Narada HESS

Nantong city, Jiangsu, China

Project Details

- PV generation: **5KWp**
- Storage capacity: **7.2KWh**
- Battery type: **48NPFC75**
- Battery quantity: **2pcs**
- Project date: **2014.10**

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Residential solution of Narada HESS

Gu An city, Hebei, China

Project Details

- PV generation: **10KWp**
- Storage capacity: **57.6KWh**
- Battery type: **48NPFC75**
- Battery quantity: **8pcs**
- Project date: **2015.07**

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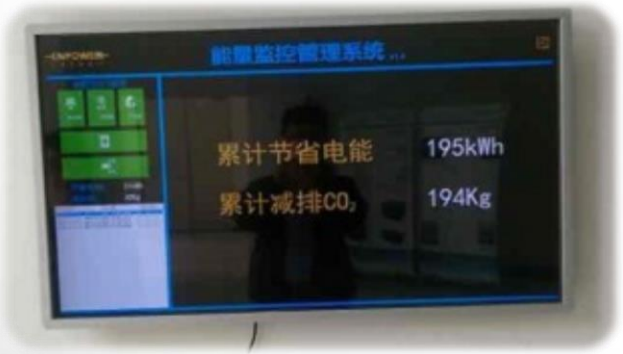
Residential solution of Narada HESS

Gu An city, Hebei, China



- **More references**

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Thanks!