

M Series External Battery Frame

User Guide

M 24-065-144 BF-NB

M 24-100-144 BF-NB

M 24-120-144 BF-NB



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Chapter 1. Important Safety Instructions

SAVE THESE INSTRUCTIONS

This manual contains important instructions that you should follow during installation and maintenance of the M Series External Battery Frame (MBF). Please read all instructions before operating the equipment and save this manual for future reference. Only qualified service personnel with knowledge of batteries and the required precautions should perform servicing.



DANGER

Batteries present a risk of electrical shock or burn from high short-circuit current. Batteries also pose a toxic danger due leakage of hazardous chemicals. To reduce the risks associated with exposure to toxic chemicals, electrical shocks and burns:

- Remove watches, rings, or other metal objects
- Use tools with insulated handles.
- Test for voltage before handling equipment.
- Wear protective glasses, gloves and boots.
- Do not lay tools or other metal parts on top of batteries.
- Keep unauthorized personnel away from batteries.

Failure to follow these instructions will result in death or serious injury.



DANGER

Batteries may explode when exposed to open flame. To reduce the risk of explosion:

- Keep sparks and flames away from the batteries.
- Never dispose of batteries in a fire.
- Proper disposal of batteries is required.
- Refer to local codes for disposal requirements.

Failure to follow these instructions will result in death or serious injury.



DANGER

To reduce the risk of fire or electric shock:

- Install or service the M Series Battery Frame in a temperature and humidity controlled, indoor environment, free of conductive contaminants.
- Ambient temperature must not exceed 40°C (104°F).
- Do not operate near water or excessive humidity (30-90% non-condensing).
- Overcurrent protection and disconnect switch must be provided by others.
- Install the M Series Battery Frame so that all wiring is inaccessible to users.

Failure to follow these instructions may result in death or serious injury.



Recycling of Used Batteries

Contact your local recycling or hazardous waste center for information on proper disposal of the used battery.

1.1. Technical Notice

If the M Series Battery Frame (MBF) requires transportation, consult with the transport company and take the recommended precautions. Always disconnect batteries and isolate prior to transportation.

If the MBF must be stored, protect it from excessive humidity and heat.

Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C, 30-90% non-condensing humidity.

Keep batteries away from heat sources.

Do not install the MBF and batteries in direct sunlight, battery lifetime may be reduced, and the battery warranty may be invalidated.

Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

An unused battery should be recharged every 6 months. Temporarily connect the MBF and batteries to the UPS with a suitable AC supply and activate it for the time required to recharge the batteries.

When replacing batteries, only replace with the same type, capacity and quantity. Do not mix old and new batteries; do not mix different capacities or brands.

The warranty for this battery cabinet will be void if water or other liquid is spilt or poured directly onto the battery cabinet. Similarly, we do not warrant any damage to the battery bank if foreign objects are deliberately or accidentally inserted into the battery cabinet enclosure.

Chapter 2. Overview

The MBF are designed for use with the M and C Series UPS. Dimensions are given below.

The MBF is configured to output $\pm 144V$, supplied by 24 batteries in 2 sets connected in Series as BAT+, BATN, BAT-.

M 24-065-144 BF-NB	W 600 * H 1600* D 850 mm
M 24-100-144 BF-NB	W 600 * H 2000* D 850 mm
M 24-120-144 BF-NB	W 600 * H 2000* D 850 mm

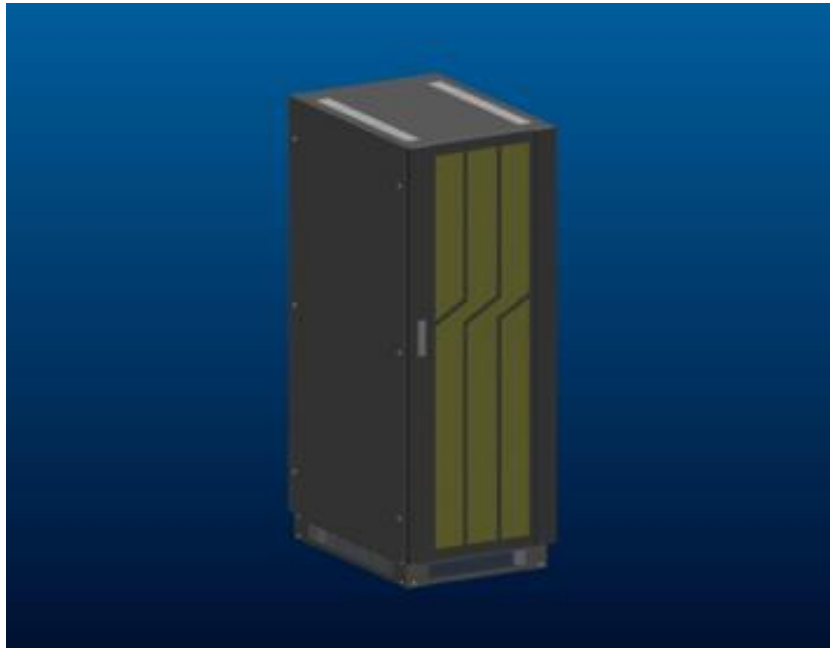


Figure 1

Chapter 3. Selecting Installation Position

It is necessary to select a proper indoors environment for the unit, in order to minimize the possibility of damage to the battery bank and extend the life of the batteries.

1. Keep at least 20cm (8 inches) clearance from the rear panel of the battery bank from the wall or other obstructions.
2. Do not block the airflow to the ventilation openings of the unit.
3. Please ensure the installation site environmental conditions are in accordance with the battery bank operating specifications to avoid overheating and exposure to excessive moisture.
4. Do not place the battery bank in a dusty or corrosive environment or near flammable material.
5. This battery frame is designed for indoor use only.

Chapter 4. Installation of M 24-065-144 BF-NB

The condition of the unit should be inspected carefully during the unpacking process. Retain the packing material for future use.

WARNING



The battery frame is heavy. To reduce the risk of personal injury:

- Be cautious when unpacking and lifting the battery frame.
- The battery frame is heavy and weights more than 50 kg.

Failure to follow these instructions may result in serious injury.

4.1. Unpacking

1. Remove the battery cabinet from the packaging.
2. Remove the packing materials and save for later use.
3. Standard Package includes:

M 24-065-144 BF-NB contains the following accessories:

No.	Name	Specification	Pcs.	No.	Name	Specification	Pcs.
1	Cable 1#	400mm (black)	8	5	Cable 5#	750mm (black)	1
2	Cable 2#	500mm (black)	4	6	60kVA Breaker	ABS203b 3P 250A/250Vdc/415Vac	1
3	Cable 3#	1200mm (black)	1	7	100kVA Breaker	ABS403b 3P 400A/415Vac 40KA/50KA	1
4	Cable 4#	650mm (black)	1				

4.2. Installation Instructions

The M 24-065-144 BF-NB is designed to hold 24 pieces of 65AH size batteries.



DANGER

Reversing the polarity of DC connections presents the risk of fire or electrical shock. To reduce the risk of fire or electric shock:

- Ensure the correct polarity of all DC connections.
- Do not allow metal to contact battery terminals or cable lugs.
- Do not touch battery terminals or cable lugs.

Failure to follow these instructions may result in death or serious injury

1. Remove the side and rear wall panels, see Fig.2.

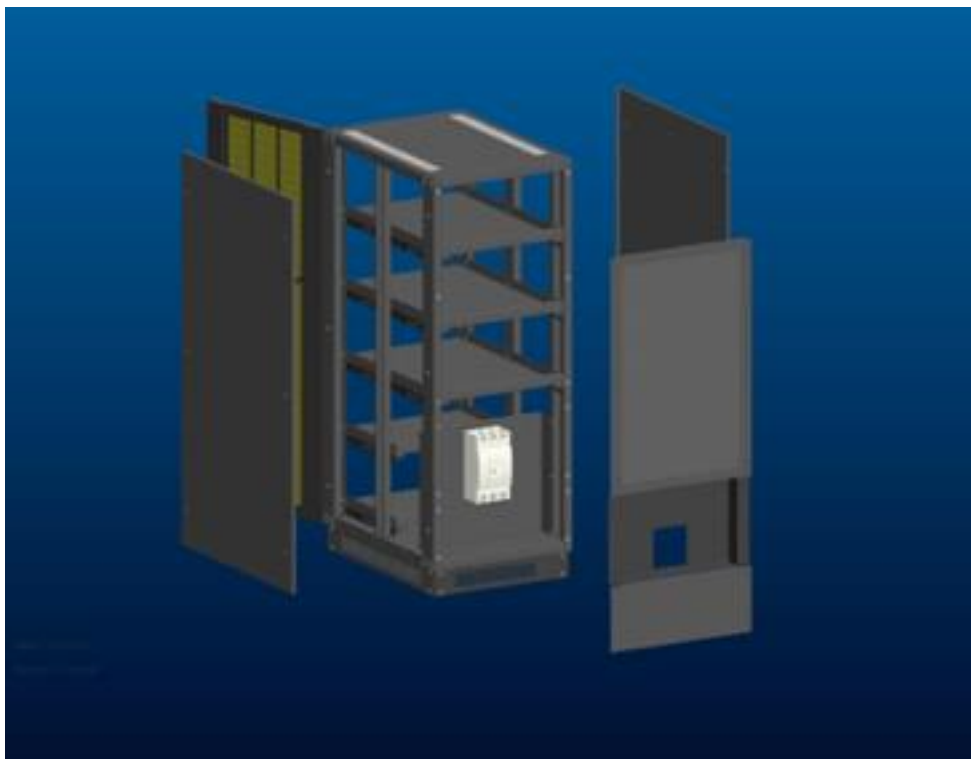


Figure 2

2. Remove the 2nd, 3rd, 4th, 5th shelf plates. Install the batteries on the 1st level (base) according to Fig.3 Connect and secure the inter-battery cables according to Fig.5.

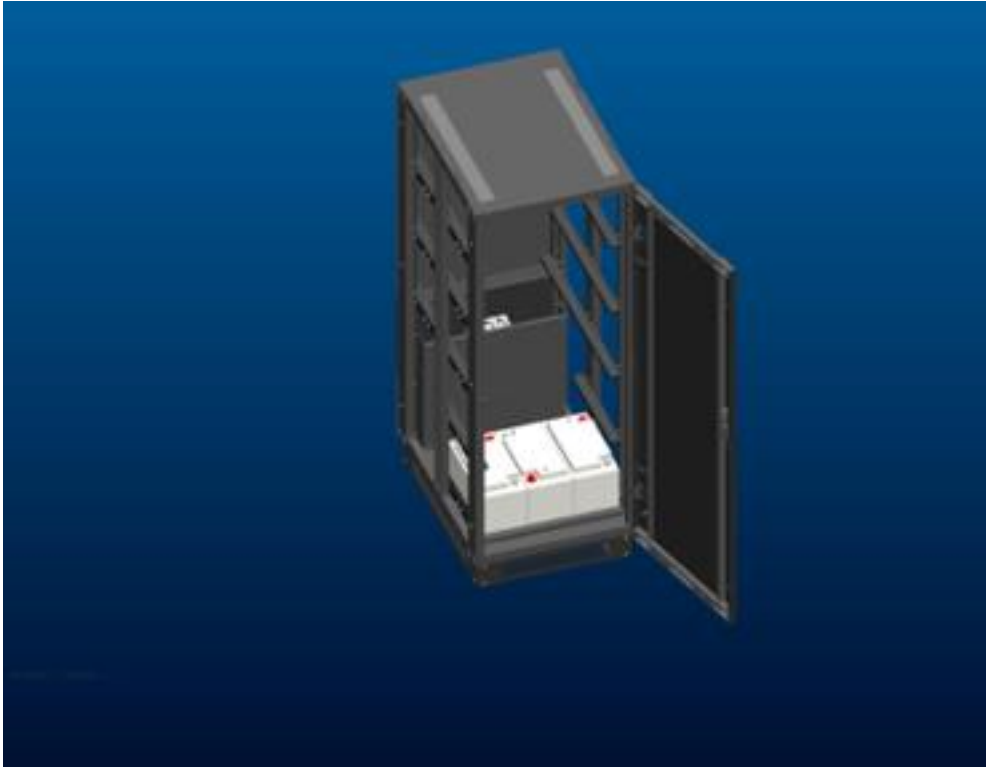


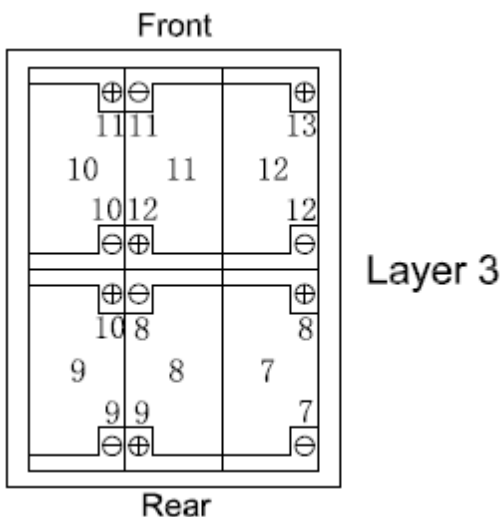
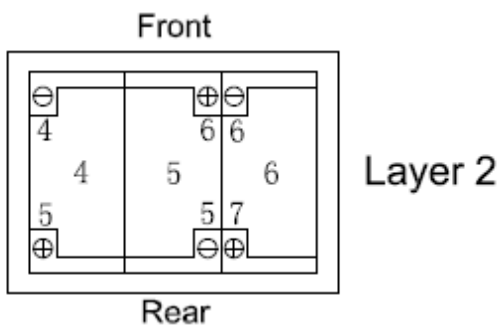
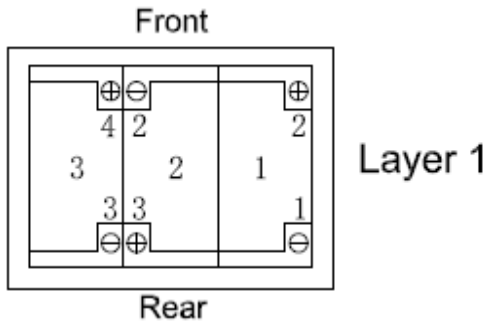
Figure 3

3. Install the 2nd, 3rd, 4th and 5th battery shelf plates in the cabinet as shown in Fig.4. Place the batteries on each shelf in the same configuration as the 1st level. Complete the battery connections for all 5 layers according to Fig.5. Confirm all connections are tight and secure.



Figure 4

4. After finishing the inter-battery connections, a cable from the BAT+ of the 5th layer goes to the “+” breaker (BAT+), another cable from BAT+ of the 3rd layer (13th bat+) goes to the “N” breaker (BATN), the last cable from BAT- of the 1st layer goes to the “-” breaker (BAT-) as shown in Fig.5.
5. When battery installation is completed, confirm that the wiring and battery voltage are both correct. Then re-install the side panels, back panel and top cover.
6. The battery cabinet should be grounded using cables with at least 50mm² diameter.



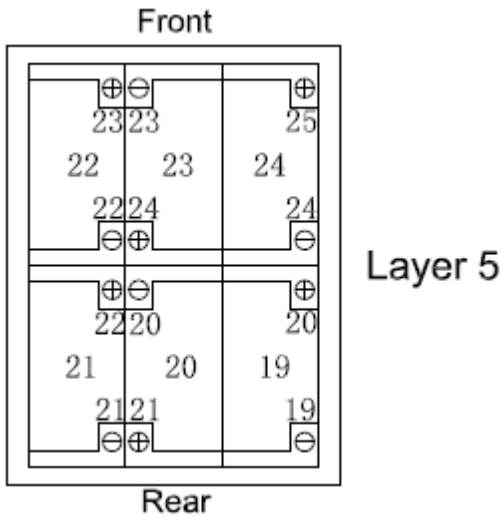
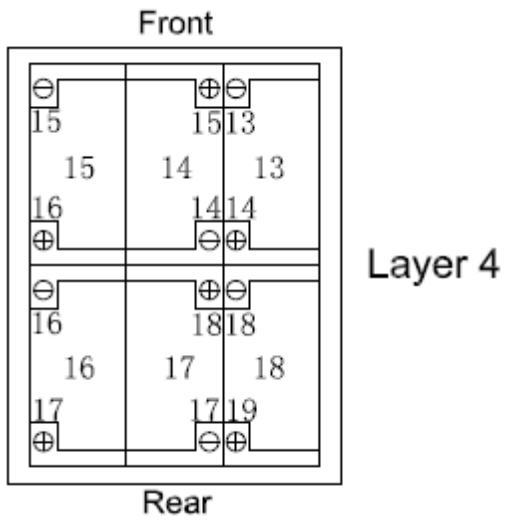


Figure 5

4.3. M 24-065-144 BF-NB Inter-Battery Connection Guide

Connect	From	Connect to
5#	Battery 1 Pin 1	Battery breaker pin 3 BAT-
1#	Battery 1 Pin 2	Battery 2 pin 2
Copper 1	Battery 2 Pin 3	Battery 3 pin 3
2#	Battery 3 Pin 4	Battery 4 pin 4
1#	Battery 4 Pin 5	Battery 5 pin 5
Copper 1	Battery 5 Pin 6	Battery 6 pin 6
2#	Battery 6 Pin 7	Battery 7 pin 7
1#	Battery 7 Pin 8	Battery 8 pin 8
Copper 1	Battery 8 Pin 9	Battery 9 pin 9
Copper 2	Battery 9 Pin 10	Battery 11 pin 10
Copper 1	Battery 10 Pin 11	Battery 11 pin 11
1#	Battery 11 Pin 12	Battery 12 pin 12
2#	Battery 12 Pin 13	Battery 13 pin 13
4#	Battery 12 Pin 13	Battery breaker pin 2 BATN
Copper 1	Battery 13 Pin 14	Battery 14 pin 14
1#	Battery 14 Pin 15	Battery 15 pin 15
Copper 2	Battery 15 Pin 16	Battery 16 pin 16
1#	Battery 16 Pin 17	Battery 17 pin 17
Copper 1	Battery 17 Pin 18	Battery 18 pin 18
2#	Battery 18 Pin 19	Battery 19 pin 19
1#	Battery 19 Pin 20	Battery 20 pin 20
Copper 1	Battery 20 Pin 21	Battery 21 pin 21
Copper 2	Battery 21 Pin 22	Battery 22 pin 22
Copper 1	Battery 22 Pin 23	Battery 23 pin 23
1#	Battery 23 Pin 24	Battery 24 pin 24
3#	Battery 24 Pin 25	Battery breaker pin 1 BAT+

Chapter 5. Installation of M 24-100-144 BF-NB and M 24-120-144 BF-NB

The condition of the unit should be inspected carefully during the unpacking process. Retain the packing material for future use.

WARNING



The battery frame is heavy. To reduce the risk of personal injury:

- Be cautious when unpacking and lifting the battery frame.
- The battery frame is heavy and weights more than 50 kg.

Failure to follow these instructions may result in serious injury.

5.1. Unpacking

4. Remove the battery cabinet from the packaging.
5. Remove the packing materials and save for later use.
6. Standard Package includes:

M 24-100-144 BF-NB and M 24-120-144 BF-NB contain the following accessories:

No.	Name	Specification	Pcs.	No.	Name	Specification	Pcs.
1	Cable 1#	350mm (black)	16	6	Cable 6#	900mm (black)	1
2	Cable 2#	640mm (black)	2	7	Cable 7#	1400mm (black)	1
3	Cable 3#	580mm (black)	1	8	Cable 8#	650mm (black)	1
4	Cable 4#	700mm (black)	1	9	Breaker	ABS603b 3P 600A/250Vdc/415Vac 40KA/50KA LS	1
5	Cable 5#	870mm (black)	1				

5.2. Installation Instructions

The M 24-100-144 BF-NB and M 24-120-144 BF-NB are designed to hold 24 pieces of 100AH or 120 AH size batteries.

DANGER



Reversing the polarity of DC connections presents the risk of fire or electrical shock. To reduce the risk of fire or electric shock:

- Ensure the correct polarity of all DC connections.
- Do not allow metal to contact battery terminals or cable lugs.
- Do not touch battery terminals or cable lugs.

Failure to follow these instructions may result in death or serious injury

7. Remove the side and rear wall panels, see Fig.2.

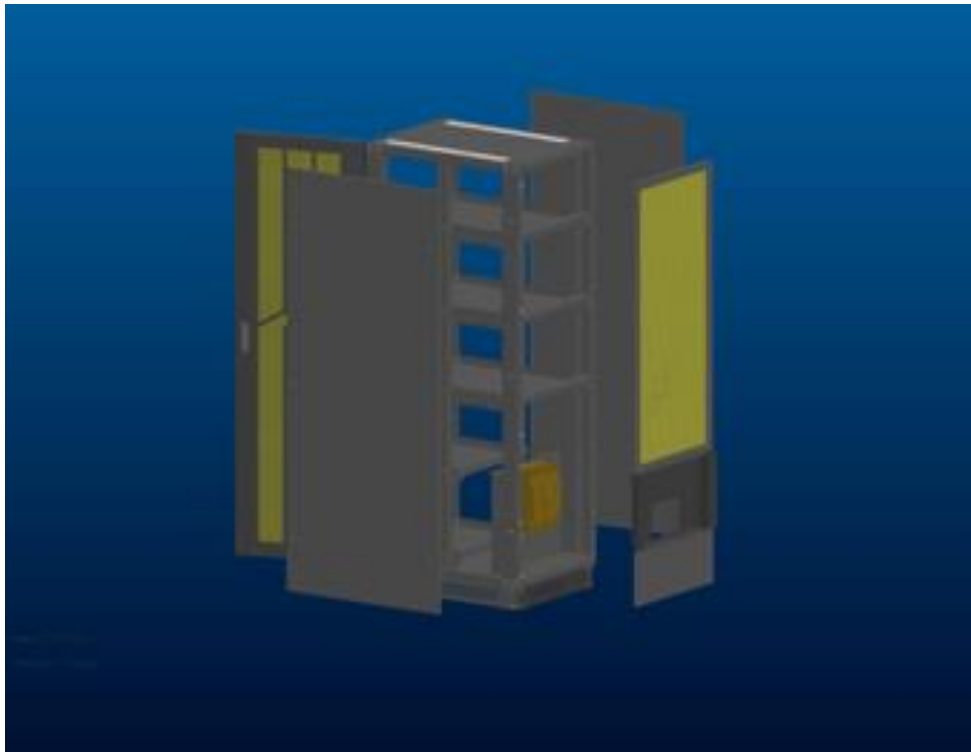


Figure 6

8. Remove the 2nd, 3rd, 4th, 5th shelf plates. Install the batteries on the 1st level (base) according to Fig.3 Connect and secure the inter-battery cables according to Fig.5.

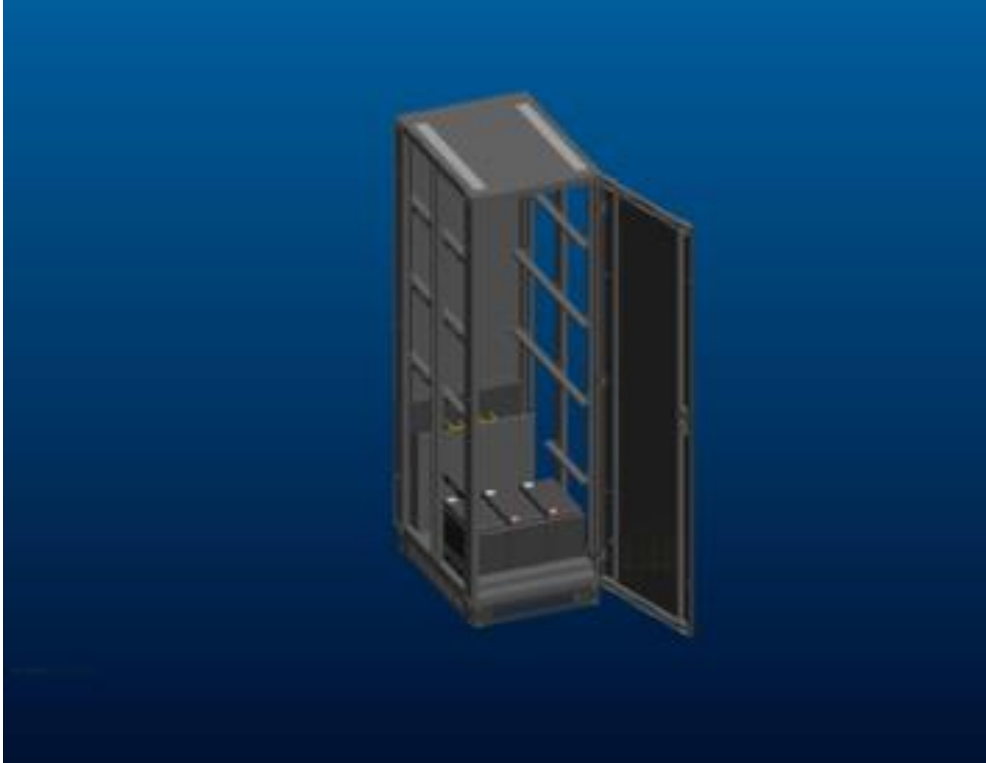


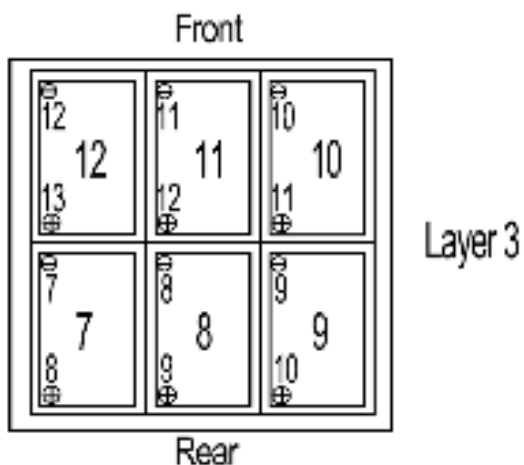
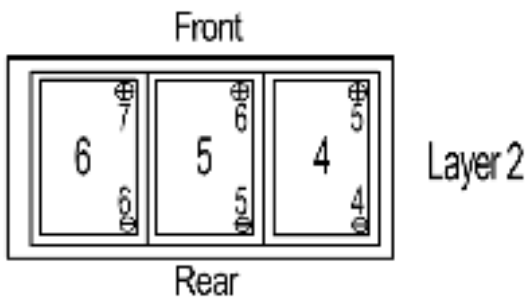
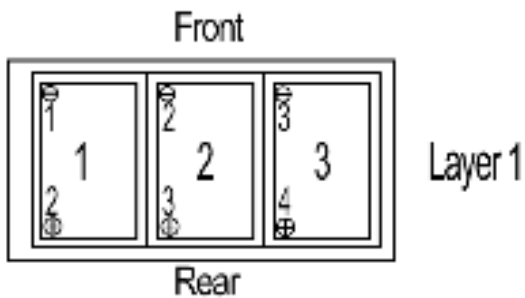
Figure 7

9. Install the 2nd, 3rd, 4th and 5th battery shelf plates in the cabinet as shown in Fig.4. Place the batteries on each shelf in the same configuration as the 1st level. Complete the battery connections for all 5 layers according to Fig.5. Confirm all connections are tight and secure.



Figure 8

10. After finishing the inter-battery connections, a cable from the BAT+ of the 5th layer goes to the “+” breaker (BAT+), another cable from BAT+ of the 3rd layer (13th bat+) goes to the “N” breaker (BATN), the last cable from BAT- of the 1st layer goes to the “-” breaker (BAT-) as shown in Fig.5.
11. When battery installation is completed, confirm that the wiring and battery voltage are both correct. Then re-install the side panels, back panel and top cover.
12. The battery cabinet should be grounded using cables with at least 50mm² diameter.



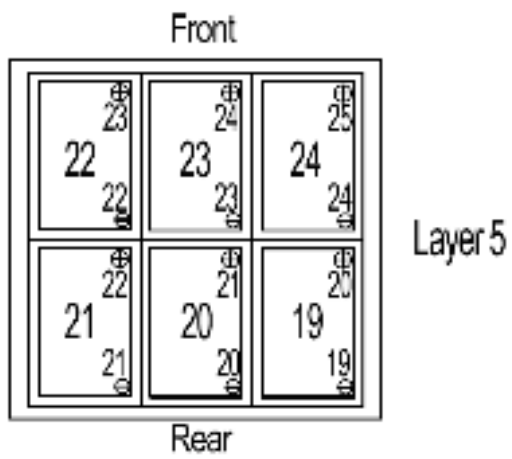
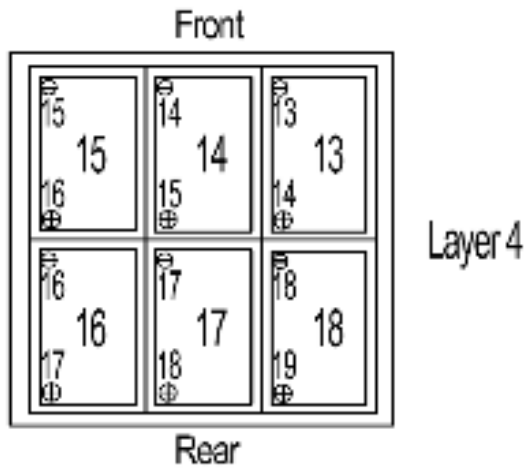


Figure 9

5.3. M 24-100-144 BF-NB and M 24-120-144 BF-NB Inter-Battery Connection Guide

Connect	From	Connect to
8#	Battery 1 Pin 1	Battery breaker pin 3 BAT-
1#	Battery 1 Pin 2	Battery 2 pin 2
1#	Battery 2 Pin 3	Battery 3 pin 3
2#	Battery 3 Pin 4	Battery 4 pin 4
1#	Battery 4 Pin 5	Battery 5 pin 5
1#	Battery 5 Pin 6	Battery 6 pin 6
3#	Battery 6 Pin 7	Battery 7 pin 7
1#	Battery 7 Pin 8	Battery 8 pin 8
1#	Battery 8 Pin 9	Battery 9 pin 9
4#	Battery 9 Pin 10	Battery 11 pin 10
1#	Battery 10 Pin 11	Battery 11 pin 11
1#	Battery 11 Pin 12	Battery 12 pin 12
5#	Battery 12 Pin 13	Battery 13 pin 13
6#	Battery 12 pin 13	Battery breaker pin 2 BATN
1#	Battery 13 Pin 14	Battery 14 pin 14
1#	Battery 14 Pin 15	Battery 15 pin 15
Copper	Battery 15 Pin 16	Battery 16 pin 16
1#	Battery 16 Pin 17	Battery 17 pin 17
1#	Battery 17 Pin 18	Battery 18 pin 18
2#	Battery 18 Pin 19	Battery 19 pin 19
1#	Battery 19 Pin 20	Battery 20 pin 20
1#	Battery 20 Pin 21	Battery 21 pin 21
Copper	Battery 21 Pin 22	Battery 22 pin 22
1#	Battery 22 Pin 23	Battery 23 pin 23
1#	Battery 23 Pin 24	Battery 24 pin 24
7#	Battery 24 Pin 25	Battery breaker pin 1 BAT+

5.4. Storage Instruction

For extended periods of storage, ensure batteries are kept in a moderate climate (-15 to +30 °C / +5 to +86 °F). The batteries should be charged every 6 months by plugging into the UPS. If stored under high temperature (+30 to +45 °C / +86 to +113 °F) environment, repeat every three months.

5.5. Specification

Model	M 24-065-144 BF-NB	M 24-100-144 BF-NB	M 24-120-144 BF-NB
12V Battery	65AH	100AH	120AH
Nominal DC Voltage	+/- 144 VDC	+/- 144 VDC	+/- 144 VDC
Internal Configuration	24 pcs	24 pcs	24 pcs
Breaker	(1x) ABS203b 3P 250A/250Vdc/415Vac (1x) ABS403b 3P 400A/415Vac 40KA/50KA	(1x) ABS603b 3P 600A/250Vdc/415Vac 40KA/50KA LS	(1x) ABS603b 3P 600A/250Vdc/415Vac 40KA/50KA LS
Net Weight kg (w/o battery)	197	197	197
H x W x L mm	1600 x 600 x 850	2000 x 600 x 850	2000 x 600 x 850