

The power behind competitiveness

Delta UPS - Amplon Family

RT Series, Single Phase

1/ 1.5/ 2/ 3 kVA

Maintenance Bypass Box

User Manual

Save This Manual

This manual contains important instructions and warnings that you should follow during the installation, operation, storage and maintenance of this product. Failure to heed these instructions and warnings will void the warranty.

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Table of Contents

Chapter 1 : Product Introduction	1
Chapter 2 : Important Safety Instructions	2
Chapter 3 : Package List	4
Chapter 4 : Standard Compliance	7
Chapter 5 : Rear View	8
Chapter 6 : How to Install the Maintenance Bypass Box on the UPS	10
Chapter 7 : How to Install the Maintenance Bypass Box on the External Battery Pack	13
Chapter 8 : How to Install the Maintenance Bypass Box on the Rack	17
Chapter 9 : How to Install the Maintenance Bypass Box into the Tower Stands	23
Chapter 10 : Wiring	25
Chapter 11 : Start-up Operation	27
Chapter 12 : Maintenance	28
Chapter 13 : Technical Specifications	30
Appendix 1 : Warranty	33

Chapter 1 : Product Introduction

The Maintenance Bypass Box (MBB) is designed to operate in conjunction with the Delta RT series 1 ~ 3kVA UPS. It ensures that the connected critical loads continue to be powered by the input power during UPS maintenance or during the unlikely event of a UPS failure.

Chapter 2 : Important Safety Instructions

- Only qualified service personnel can perform installation and maintenance of the Maintenance Bypass Box.
- The Maintenance Bypass Box must operate in conjunction with Delta RT series 1 ~ 3kVA UPS. Please refer to the following table.

Maintenance Bypass Box Model	MBB-RT-1.5K PDB1115A1300B8	MBB-RT-2K PDB1116A1300B8	MBB-RT-3K PDB1117A1300B8
Applicable to Delta RT series UPS Model	RT-1K RT-1.5K	RT-2K	RT-3K

- Before installation of the Maintenance Bypass Box, please completely turn off the UPS and cut off the input power and battery power (if applicable).
- To reduce the risk of fire, only connect the Maintenance Bypass Box to a circuit with branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/ NFPA 70 and the Canadian Electrical Code, Part 1, C22.1. The suggested branch circuit breaker's current capacity is listed in the table below.

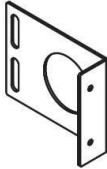
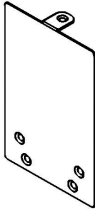
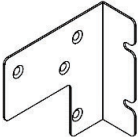
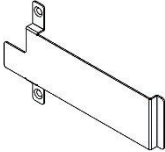


Model	Maximum Current of Branch Circuit Breaker
MBB-RT-1.5K (PDB1115A1300B8)	20A
MBB-RT-2K (PDB1116A1300B8)	20A
MBB-RT-3K (PDB1117A1300B8)	30A



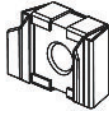
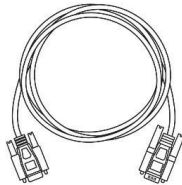
- Failure to properly install the Maintenance Bypass Box may result in severe damage to your UPS or load equipment.
- Please install the Maintenance Bypass Box in an indoor temperature controlled environment that is free of conductive contaminants.

- Do not operate the unit in an extremely dusty/ unclean area or a location near heating devices, water and excessive humidity. Do not expose the unit to direct sunlight.
- Select a location where provides good air circulation for the unit at all times.
- Properly route power cords so they cannot be walked on or damaged.
- The Maintenance Bypass Box must be well grounded due to a possible risk of current leakage.
- The Maintenance Bypass Box is not intended for use in direct patient care or life support applications.

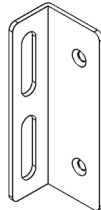
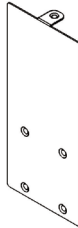
Chapter 3 : Package List

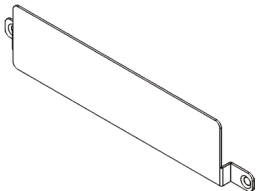



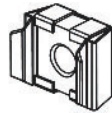
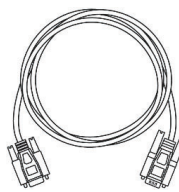
For PDB1115A1300B8

No.	ITEM	Q'ty	Drawing
①	MBB EAR (For Rack)	2 PCS	
②	MBB EAR (For Tower)	1 PC	
③	MBB EAR (For Tower)	1 PC	
④	UPS Output Cover	1 PC	
⑤	M4 Screw (Flat Head)	4 PCS	
⑥	M4 Screw (Pan Head)	2 PCS	

No.	ITEM	Q'ty	Drawing
⑦	M5 Screw	4 PCS	
⑧	#6-32 Screw	3 PCS	
⑨	M5 Cage Nut	4 PCS	
⑩	RS-232 Cable	1 PC	

For PDB1116A1300B8 & PDB1117A1300B8

No.	ITEM	Q'ty	Drawing
①	MBB EAR (For Rack)	2 PCS	
②	MBB EAR (For Tower)	1 PC	

No.	ITEM	Q'ty	Drawing
③	UPS Output Cover	1 PC	
④	M4 Screw	4 PCS	
⑤	M5 Screw	4 PCS	
⑥	#6-32 Screw	4 PCS	
⑦	M5 Cage Nut	4 PCS	
⑧	RS-232 Cable	1 PC	



NOTE:

1. If there is any damage or anything missing, please immediately contact the dealer from whom you purchased the unit.
2. If the Maintenance Bypass Box needs to be returned, carefully repack the Maintenance Bypass Box and all of the accessories using the original packing material that came with the unit.

Chapter 4 : Standard Compliance

- UL/ CE
- IEC/ EN 62040-1
- IEC/ EN 62040-2 CATEGORY C2

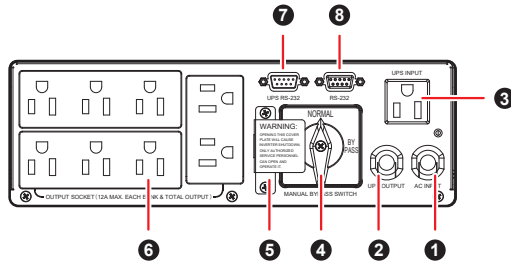
Chapter 5 : Rear View



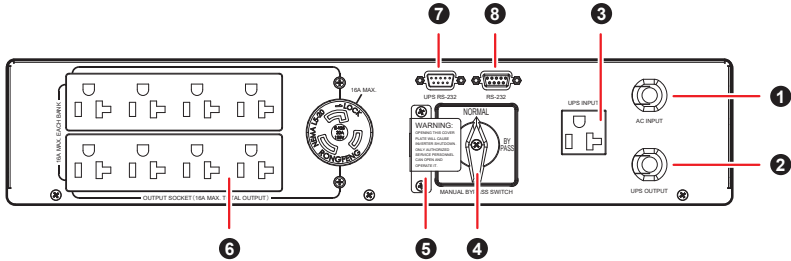
NOTE:

There are no operational components or interfaces on the front of the MBB.

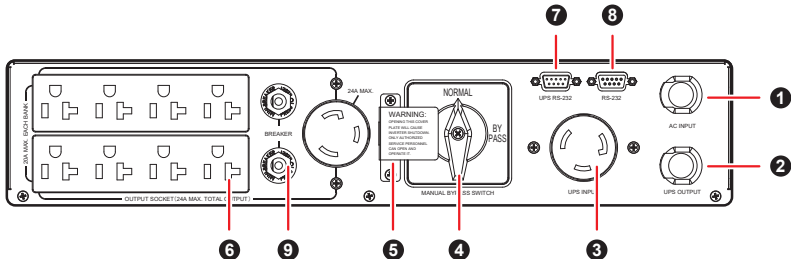
- **PDB1115A1300B8**



- **PDB1116A1300B8**



- **PDB1117A1300B8**



No.	Item	Connection
❶	AC Input	Connects to the main AC utility.
❷	UPS Output	Connects to the UPS's output socket.
❸	UPS Input	Connects to the UPS's AC input power cord.
❹	Manual Bypass Switch	No connection is needed. The function is to switch the UPS into manual bypass mode for maintenance without power supply interruption.
❺	Manual Bypass Switch Cover Plate	No connection is needed. After you unscrew the two screws shown in Figure 27 to remove the cover plate, the MBB's detector will automatically activate and send a message to the UPS to ask it to transfer into bypass mode.
❻	Output Sockets	Connect to the critical loads.
❼	UPS RS-232	Connects to the UPS's RS-232 port.
❽	RS-232	Connects to your computer's RS-232 port.
❾	Output Breakers	No connection is needed. The function is to prevent the output socket(s) from damage caused by overload.

Chapter 6 : How to Install the Maintenance Bypass Box on the UPS

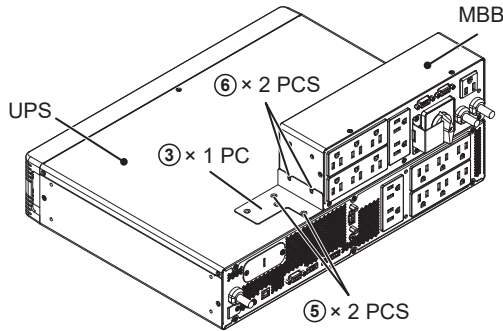


NOTE:

1. In this User Manual, MBB means Maintenance Bypass Box.
2. For the meaning of ① ~ ⑩ shown in this chapter, please refer to **Figure 3**.

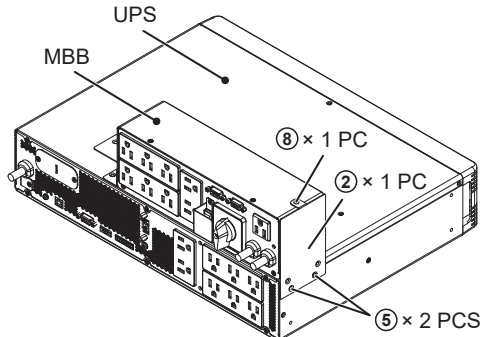
• PDB1115A1300B8

1. Fix the MBB Ear (③) on the top cover of the UPS with two flat-head M4 screws (⑤) and at the left side of the MBB with two pan-head M4 screws (⑥). Please refer to **Figure 1**.



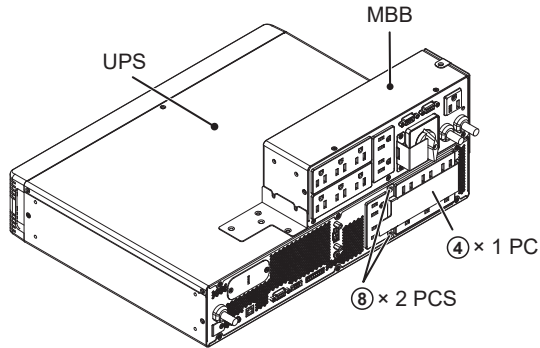
(Figure 1)

2. Fix the MBB Ear (②) at the right side of the UPS with two flat-head M4 screws (⑤) and at the right side of the MBB with one #6-32 screw (⑧). Please refer to **Figure 2**.



(Figure 2)

3. Install the UPS Output Cover (④) at the back of the UPS with two #6-32 screws (⑧).



(Figure 3)

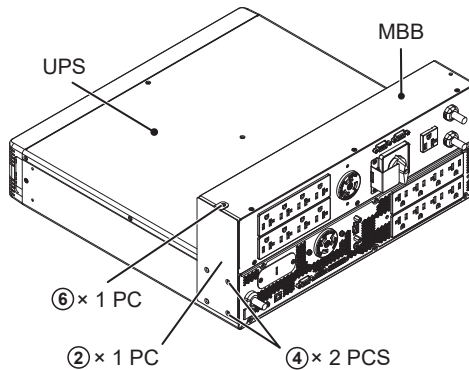
● PDB1116A1300B8/ PDB1117A1300B8



NOTE:

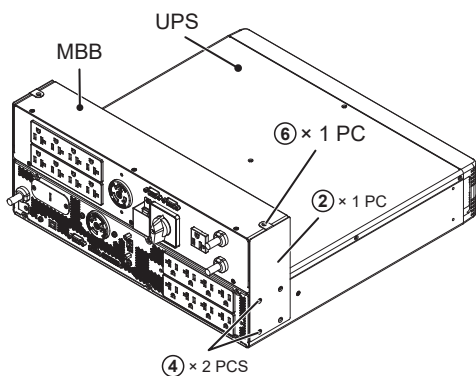
Since models PDB1115A1300B8 and PDB1117A1300B8 have the same standard accessories and the accessory installation methods are the same, only model PDB1115A1300B8 is used for illustration (please see **Figure 4 ~ Figure 6**).

1. Fix the MBB Ear (②) at the left side of the UPS with two M4 screws (④) and at the left side of the MBB with one #6-32 screw (⑥). Please refer to **Figure 4**.



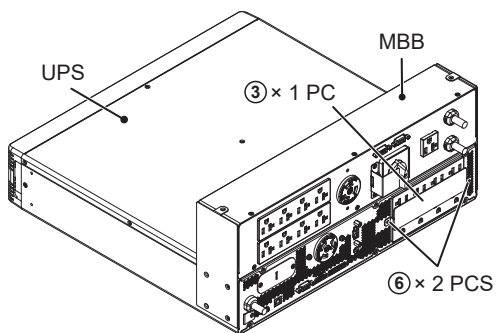
(Figure 4)

2. Fix the MBB Ear (②) at the right side of the UPS with two M4 screws (④) and at the right side of the MBB with one #6-32 screw (⑥).



(Figure 5)

3. Install the UPS Output Cover (③) at the back of the UPS with two #6-32 screws (⑥).



(Figure 6)

Chapter 7 : How to Install the Maintenance Bypass Box on the External Battery Pack

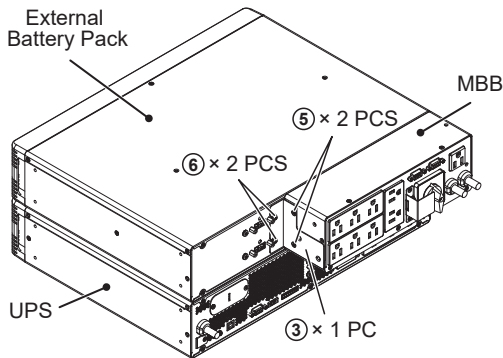


NOTE:

1. In this User Manual, MBB means Maintenance Bypass Box.
2. For the meaning of ① ~ ⑩ shown in this chapter, please refer to **Figure 3**.

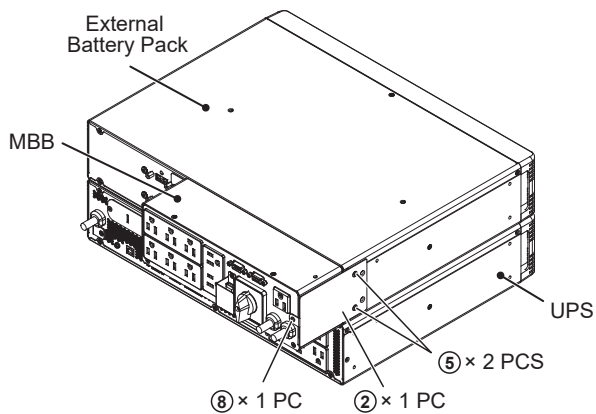
• PDB1115A1300B8

1. Fix the MBB Ear (③) at the rear of the external battery pack with two pan-head M4 screws (⑥) and at the left side of the MBB with two flat-head M4 screws (⑤). Please see **Figure 7**.



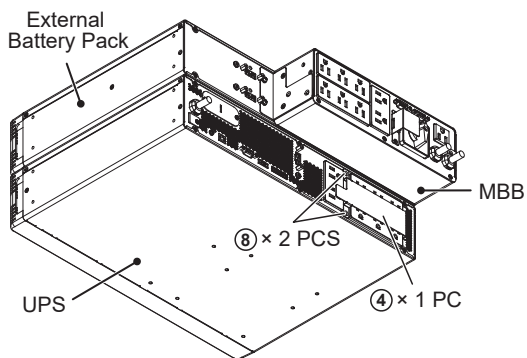
(Figure 7)

2. Fix the MBB Ear (②) at the right side of the external battery pack with two flat-head M4 screws (⑤) and at the right side of the MBB with one #6-32 screw (⑧).



(Figure 8)

3. Install the UPS Output Cover (④) at the back of the UPS with two #6-32 screws (⑧).



(Figure 9)

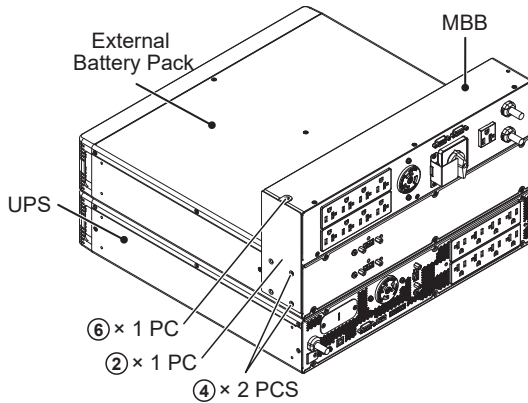
• PDB1116A1300B8/ PDB1117A1300B8



NOTE:

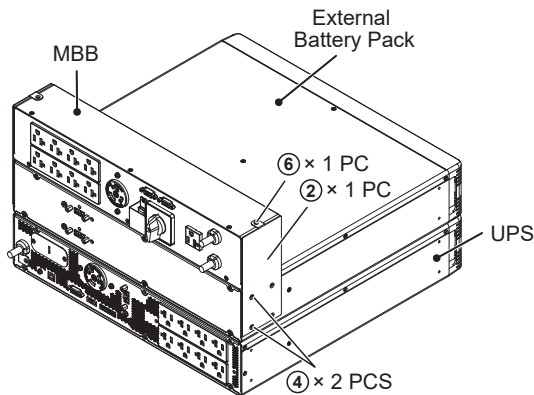
Since models PDB1115A1300B8 and PDB1117A1300B8 have the same standard accessories and the accessory installation methods are the same, only model PDB1115A1300B8 is used for illustration (please see **Figure 10 ~ Figure 12**).

1. Fix the MBB Ear (②) at the left side of the external battery pack with two M4 screws (④) and at the left side of the MBB with one #6-32 screw (⑥).



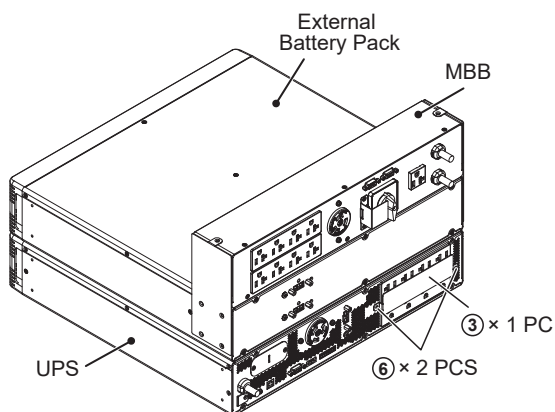
(Figure 10)

2. Fix the MBB Ear (②) at the right side of the external battery pack with two M4 screws (④) and at the right side of the MBB with one #6-32 screw (⑥).



(Figure 11)

3. Install the UPS Output Cover (③) at the back of the UPS with two #6-32 screws (⑥).



(Figure 12)

Chapter 8 : How to Install the Maintenance Bypass Box on the Rack

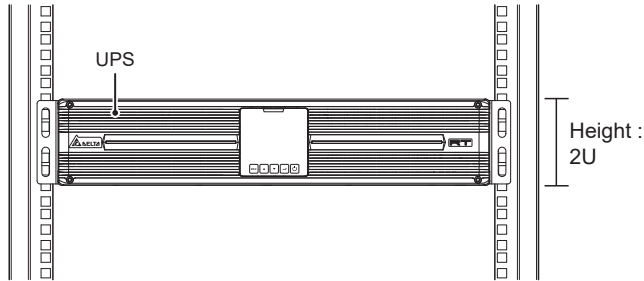


NOTE:

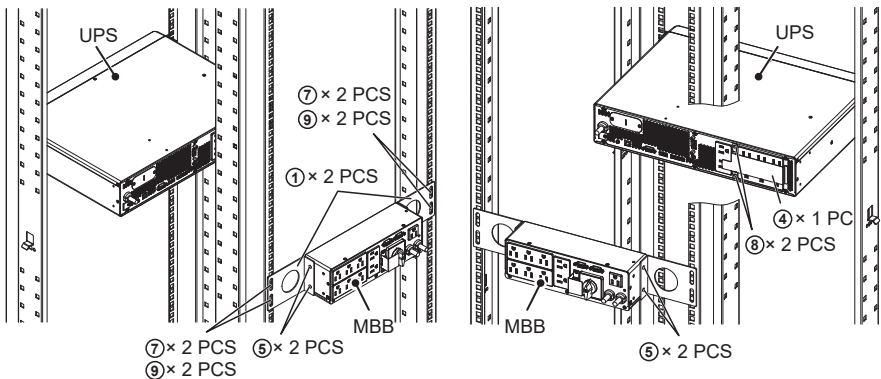
1. In this User Manual, MBB means Maintenance Bypass Box.
2. For the meaning of ① ~ ⑩ shown in this chapter, please refer to **Figure 3**.

● PDB1115A1300B8

Scenario 1: Only the UPS and MBB need to be installed on the rack. For such application, the UPS must be installed at the front of the rack, the MBB at the rear of the rack (see **Figure 13** and **Figure 14**), and the total height is 2U (see **Figure 13**)



(Figure 13)

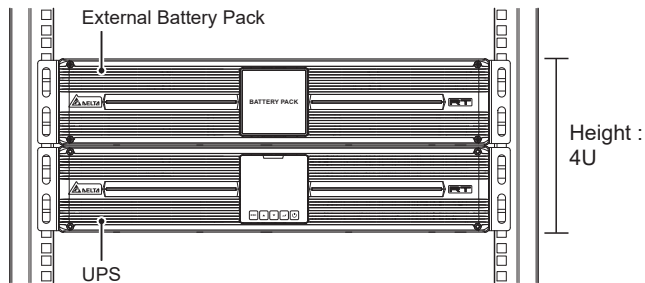


(Figure 14)

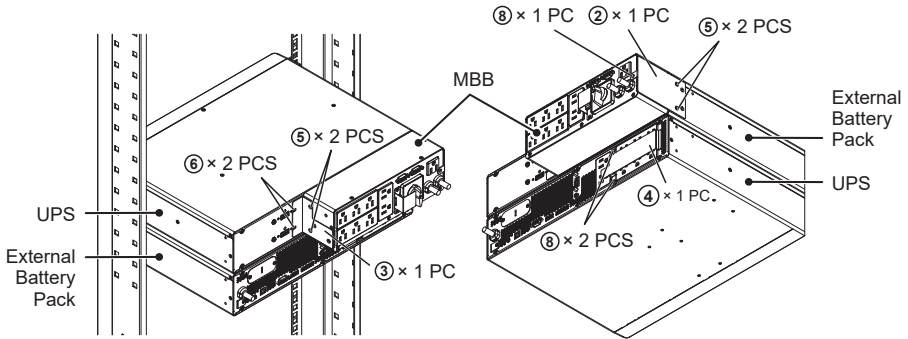
For how to install, please refer to the following instructions.

1. Use the bracket ears provided in your RT 1-3kVA UPS to install the UPS at the front of the rack. Please refer to **Figure 13** and your UPS's **Installation & Operation Quick Guide**.
2. Use the four flat-head M4 screws (⑤) to install the two MBB Ears (①) at the left and right sides of the MBB. Please see **Figure 14**.
3. Fix the four M5 cage nuts (⑨) at the two sides of the rack. Please note that the MBB should be installed at the rear of the rack. Please see **Figure 14**.
4. Use the four M5 screws (⑦) to secure the MBB on the rack's M5 cage nuts (⑨).
5. Install the UPS Output Cover (④) at the back of the UPS with two #6-32 screws (⑧). Please see **Figure 14**.

Scenario 2: The UPS, MBB and external battery pack need to be installed on the rack. For such application, the UPS and external battery pack must be installed at the front of the rack, the MBB at the back of the external battery pack (see **Figure 15** and **Figure 16**), and the total height is 4U (see **Figure 15**).



(Figure 15)



(Figure 16)

For how to install, please refer to the following instructions.

1. Use the bracket ears provided in your RT 1-3kVA UPS to install the UPS at the front of the rack. Please refer to **Figure 15** and your UPS's **Installation & Operation Quick Guide**.
2. Use the bracket ears provided in your RT 1-3kVA external battery pack to install the external battery pack at the front of the rack. Please refer to **Figure 15** and your external battery pack's **User Manual**.
3. Fix the MBB Ear (③) at the rear of the external battery pack with two pan-head M4 screws (⑥) and at the left side of the MBB with two flat-head M4 screws (⑤). Please see **Figure 16**.
4. Fix the MBB Ear (②) at the right side of the external battery pack with two M4 screws (⑥) and at the right side of the MBB with one #6-32 screw (⑧). Please see **Figure 16**.
5. Install the UPS Output Cover (④) at the back of the UPS with two #6-32 screws (⑧). Please see **Figure 16**.

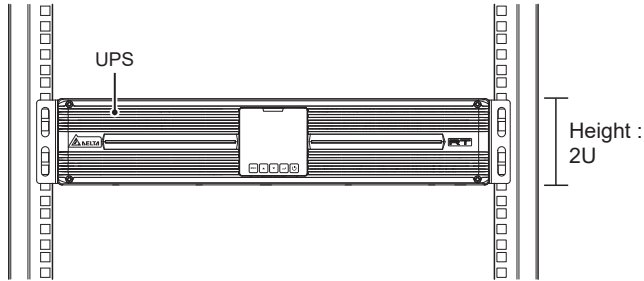
● PDB1116A1300B8/ PDB1117A1300B8



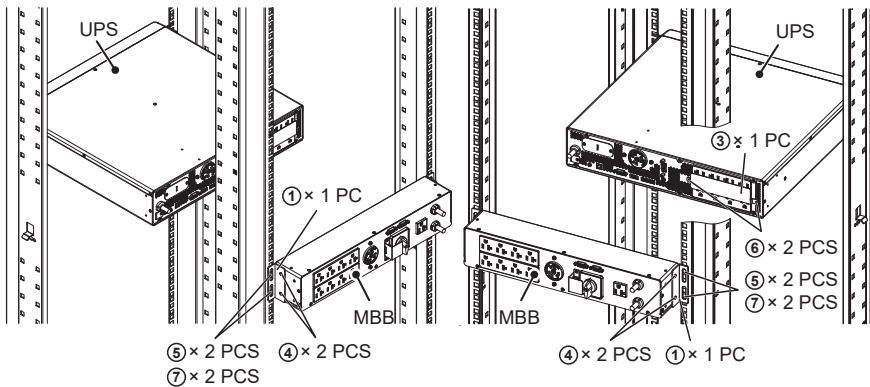
NOTE:

Since models PDB1115A1300B8 and PDB1117A1300B8 have the same standard accessories and the accessory installation methods are the same, only model PDB1115A1300B8 is used for illustration (please see **Figure 17 ~ Figure 20**).

Scenario 1: Only the UPS and MBB need to be installed on the rack. For such application, the UPS must be installed at the front of the rack, the MBB at the rear of the rack (see **Figure 17** and **Figure 18**), and the total height is 2U (see **Figure 17**).



(Figure 17)



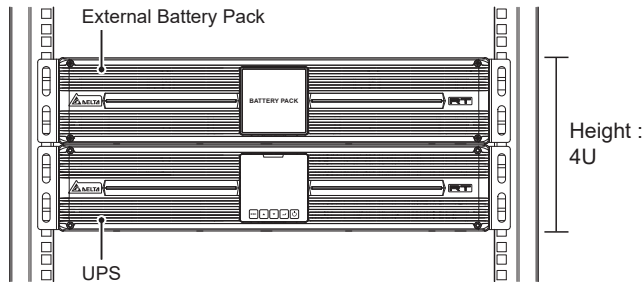
(Figure 18)

For how to install, please refer to the following instructions.

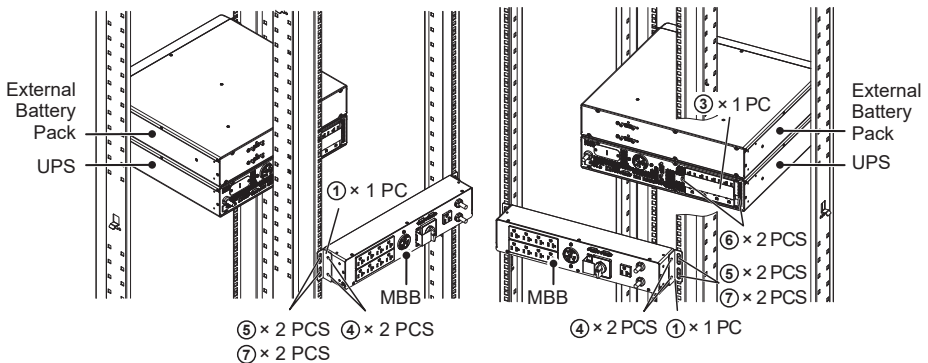
1. Use the bracket ears provided in your RT 1-3kVA UPS to install the UPS at the front of the rack. Please refer to **Figure 17** and your UPS's **Installation & Operation Quick Guide**.
2. Use the four M4 screws (④) to install the two MBB Ears (①) at the left and right sides of the MBB. Please see **Figure 18**.

3. Fix the four M5 cage nuts (⑦) at the two sides of the rack. Please note that the MBB should be installed at the rear of the rack. Please see **Figure 18**.
4. Use the four M5 screws (⑤) to secure the MBB on the rack's M5 cage nuts (⑦).
5. Install the UPS Output Cover (③) at the back of the UPS with two #6-32 screws (⑥). Please see **Figure 18**.

Scenario 2: The UPS, MBB and external battery pack need to be installed on the rack. For such application, the UPS and external battery pack must be installed at the front of the rack, the MBB at the rear of the rack (see **Figure 19** and **Figure 20**), and the total height is 4U (see **Figure 19**).



(Figure 19)



(Figure 20)

For how to install, please refer to the following instructions.

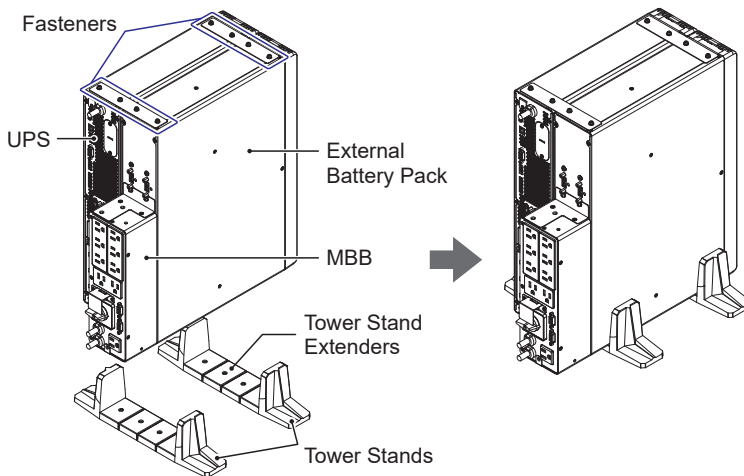
1. Use the bracket ears provided in your RT 1-3kVA UPS to install the UPS at the front of the rack. Please refer to **Figure 19** and your UPS's **Installation & Operation Quick Guide**.
2. Use the bracket ears provided in your RT 1-3kVA external battery pack to install the external battery pack at the front of the rack. Please refer to **Figure 19** and your external battery pack's **User Manual**.
3. Use the four M4 screws (④) to install the two MBB Ears (①) at the left and right sides of the MBB. Please see **Figure 20**.
4. Fix the four M5 cage nuts (⑦) at the two sides of the rack. Please note that the MBB should be installed at the rear of the rack. Please see **Figure 20**.
5. Use the four M5 screws (⑤) to secure the MBB on the rack's M5 cage nuts (⑦). Please see **Figure 20**.
6. Install the UPS Output Cover (③) at the back of the UPS with two #6-32 screws (⑥). Please see **Figure 20**.

Chapter 9 : How to Install the Maintenance Bypass Box into the Tower Stands

Please follow the procedures below and refer to **Figure 21 ~ Figure 22** to install the MBB into the tower stands.

1. Connect the tower stands (provided in your UPS's package) to tower stand extenders (provided in your external battery pack's package) and adjust the total width to 4U.
2. Follow **Chapter 7: How to Install the Maintenance Bypass Box on the External Battery Pack** to fix the MBB at the back of the external battery pack.
3. Upright the external battery pack with the MBB and place them into the tower stands.
4. Upright the UPS and place it into the tower stands.
5. Use the fastener(s) provided in your external battery pack's package to join the top of the UPS and external battery pack together.

● PDB1115A1300B8



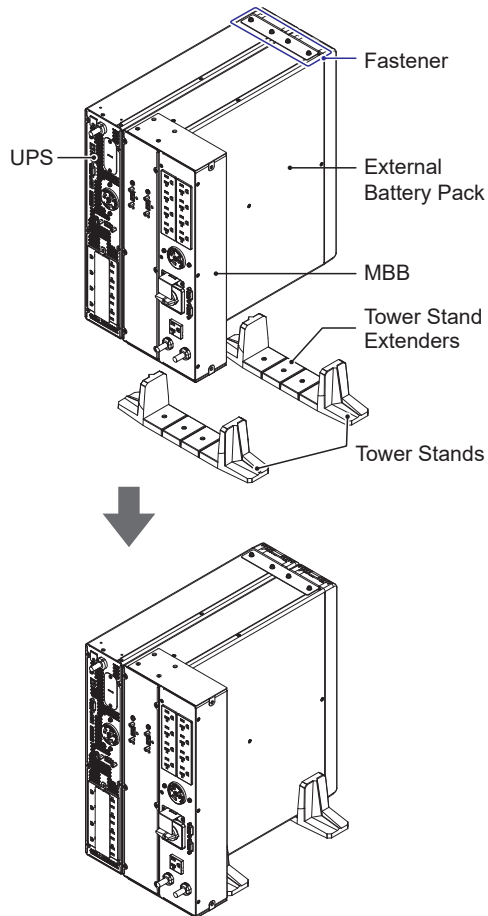
(Figure 21)

- PDB1116A1300B8/ PDB1117A1300B8



NOTE :

Since models PDB1115A1300B8 and PDB1117A1300B8 have the same installation methods, only model PDB1115A1300B8 is used for illustration (see **Figure 22**).



(Figure 22)

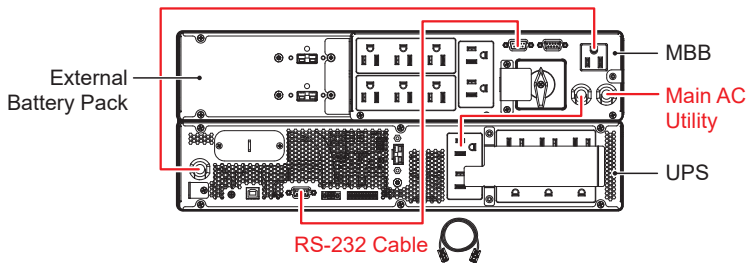
Chapter 10 : Wiring



WARNING:

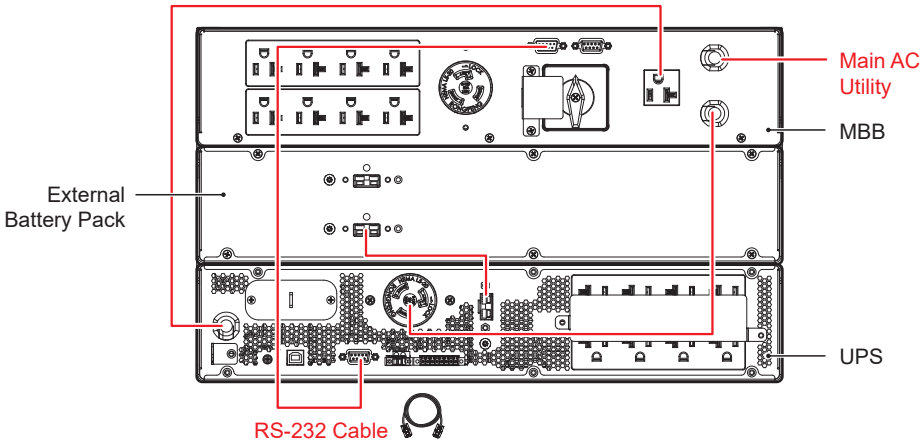
1. Follow **Chapter 2 : Important Safety Instructions**.
2. When connecting the Maintenance Bypass Box to the mains and the loads, you must install protective devices. The protective devices must be approved components that meet safety certifications.
3. Ensure that all of the breakers/ switches are in the **OFF** position before wiring.
4. Please refer to the following figures for wiring connection with the UPS.

• PDB1115A1300B8



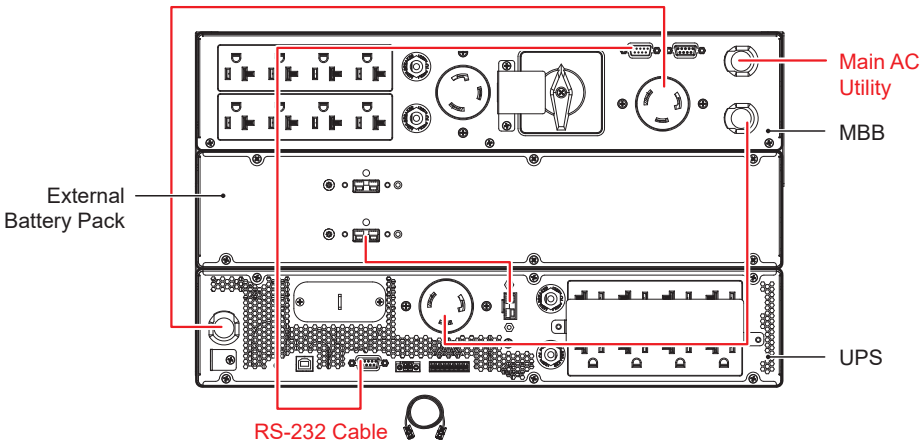
(Figure 23)

• PDB1116A1300B8



(Figure 24)

• PDB1117A1300B8



(Figure 25)

Chapter 11 : Start-up Operation

All the equipment and the UPS system must be properly connected and there must be acceptable AC voltage present.

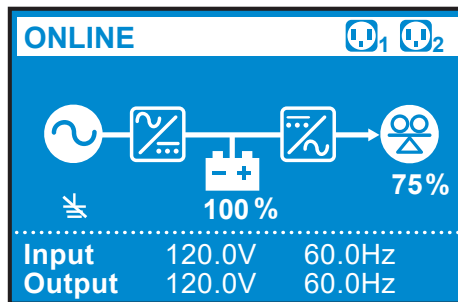
Please refer to your UPS's **Installation & Operation Quick Guide** and external battery pack's **User Manual** for more information.



NOTE:

Do not remove the cover plate of the Maintenance Bypass Box's MANUAL BYPASS SWITCH during operation.

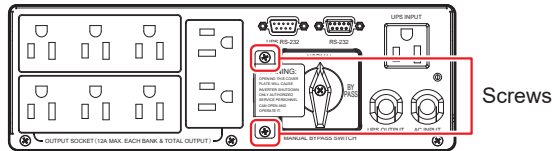
1. Verify if the MBB's AC power cord meets with N, L & G of the wall socket.
2. Plug the MBB's AC power cord into the wall socket.
3. Press and hold the ON button of the UPS for 3 seconds and release it after you hear one beep.
4. Follow below to set up the UPS.
 - a. Setting → Output → Standby Mode → Bypass output
 - b. Setting → Dry Contact Setting → DB9 - Manual Bypass → Enable
5. Press and hold the ON/ OFF button of the UPS for 3 seconds and release it after you hear one beep to turn on the UPS to ONLIN mode.



(Figure 26)

Chapter 12 : Maintenance

1. Unscrew the screws shown in **Figure 27** to remove the cover plate of the MANUAL BYPASS SWITCH.

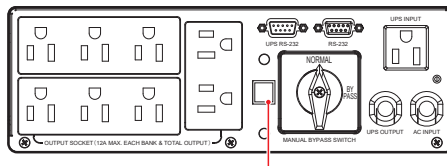


(Figure 27)



NOTE :

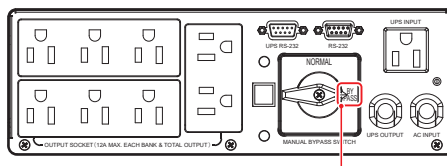
Under the cover plate, there is a manual bypass detector (please see **Figure 28**). Once the cover plate is removed, the detector will automatically activate to send a message to the UPS. The message is to ask the UPS to transfer into bypass mode. If there is a power interruption while the UPS is running in bypass mode, the connected loads won't be protected.



Manual Bypass Detector

(Figure 28)

2. After you confirm that the UPS has been run in bypass mode, switch the MANUAL BYPASS SWITCH to the BYPASS position (please see **Figure 29**).



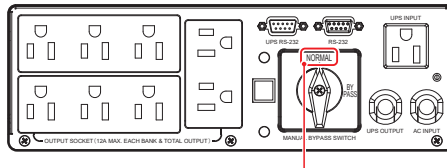
BYPASS Position

(Figure 29)

**NOTE:**

If there is a power interruption while the MANUAL BYPASS SWITCH is in the BYPASS position, the connected loads won't be protected.

3. Disconnect the power cables from the 'UPS INPUT' and 'UPS OUTPUT' of the Maintenance Bypass Box.
4. Disconnect all of the communication cables from the rear panel of the UPS.
5. Now, the UPS and the external battery pack(s) can be removed to perform maintenance.
6. Once the maintenance is completed, re-install the UPS and the external battery pack(s).
7. Reconnect all of the power cables, battery cables and communication cables.
8. After you confirm that the UPS has been run in bypass mode, switch the Maintenance Bypass Box's MANUAL BYPASS SWITCH to the NORMAL position (please see **Figure 30**).



NORMAL Position

(Figure 30)

9. Re-install the cover plate of the MANUAL BYPASS SWITCH on the Maintenance Bypass Box. This will automatically inactivate the manual bypass detector.
10. Make sure that the AC input is normal. After confirmation, press and hold the ON/ OFF button of the UPS for 3 seconds and release it after you hear one beep to turn on the UPS to ONLIN mode.

Chapter 13 : Technical Specifications

Part No.		PDB1115A1300B8
Input	Rated Voltage	100/110/115/120Vac
	Rated Frequency	50/60 Hz
	Rated Current	12A
Output	Power Factor	12A
Connection (Please refer to the printed text shown on the rear of the MBB (see Page 8)).	'AC INPUT'	NEMA 5-15P
	'UPS INPUT'	NEMA 5-15R
	'UPS OUTPUT'	NEMA 5-15P
	'OUTPUT SOCKET'	NEMA 5-15R × 8
	'UPS RS-232'	DB9 Male
	'RS-232'	DB9 Female
Environment	Operating Temperature	0 ~ 50°C (32 ~ 122°F)* ¹
	Storage Temperature	-15 ~ 50°C (-59 ~ 122°F)
	Relative Humidity	0 ~ 95% (non-condensing)
	Operating Altitude	0 ~ 3000m (0 ~ 10000 ft); 0 ~ 1000m (0 ~ 3300 ft) (without de-rating)
Physical	Dimensions (W × D × H)	270 × 75 × 88 mm (10.6 × 3.0 × 3.5 inch)
	Weight	1.92 kg (4.2 lb)

Part No.		PDB1116A1300B8
Input	Rated Voltage	100/110/115/120Vac
	Rated Frequency	50/60 Hz
	Rated Current	16A
Output	Power Factor	16A
Connection (Please refer to the printed text shown on the rear of the MBB (see Page 8)).	'AC INPUT'	NEMA 5-20P
	'UPS INPUT'	NEMA 5-20R
	'UPS OUTPUT'	NEMA L5-20P
	'OUTPUT SOCKET'	NEMA 5-15/20R x 8, L5-20R x 1
	'UPS RS-232'	DB9 Male
	'RS-232'	DB9 Female
Environment	Operating Temperature	0 ~ 50°C (32 ~ 122°F)* ¹
	Storage Temperature	-15 ~ 50°C (-59 ~ 122°F)
	Relative Humidity	0 ~ 95% (non-condensing)
	Operating Altitude	0 ~ 3000m (0 ~ 10000 ft); 0 ~ 1000m (0 ~ 3300 ft) (without de-rating)
Physical	Dimensions (W × D × H)	440 × 75 × 88 mm (17.3 × 3.0 × 3.5 inch)
	Weight	2.88 kg (6.3 lb)

Part No.		PDB1117A1300B8
Input	Rated Voltage	100/110/115/120Vac
	Rated Frequency	50/60 Hz
	Rated Current	24A
Output	Power Factor	24A
Connection (Please refer to the printed text shown on the rear of the MBB (see Page 8)).	'AC INPUT'	NEMA L5-30P
	'UPS INPUT'	NEMA L5-30R
	'UPS OUTPUT'	NEMA L5-30P
	'OUTPUT SOCKET'	NEMA 5-15/20R x 8, L5-30R x 1
	'UPS RS-232'	DB9 Male
	'RS-232'	DB9 Female
Environment	Operating Temperature	0 ~ 50°C (32 ~ 122°F)* ¹
	Storage Temperature	-15 ~ 50°C (-59 ~ 122°F)
	Relative Humidity	0 ~ 95% (non-condensing)
	Operating Altitude	0 ~ 3000m (0 ~ 10000 ft); 0 ~ 1000m (0 ~ 3300 ft) (without de-rating)
Physical	Dimensions (W × D × H)	440 × 85 × 88 mm (17.3 x 3.3 x 3.5 inch)
	Weight	4.12 kg (9.1 lb)


NOTE:

1. *¹ When the operating temperature is at 40 ~ 50°C (104 ~ 122°F), the UPS will be de-rated to 80% of its capacity.
2. Refer to the rating label for the safety rating.
3. All specifications are subject to change without prior notification.

Appendix 1 : Warranty

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship within the warranty period. If the product has any failure problem within the warranty period, Seller will repair or replace the product at its sole discretion according to the failure situation.

This warranty does not apply to normal wear or to damage resulting from improper installation, operation, usage, maintenance or irresistible force (i.e. war, fire, natural disaster, etc.), and this warranty also expressly excludes all incidental and consequential damages.

Maintenance service for a fee is provided for any damage out of the warranty period. If any maintenance is required, please directly contact the supplier or Seller.

**WARNING:**

The individual user should take care to determine prior to use whether the environment and the load characteristic are suitable, adequate or safe for the installation and the usage of this product. The User Manual must be carefully followed. Seller makes no representation or warranty as to the suitability or fitness of this product for any specific application.



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