# Eaton 9PX Gen2

Advanced User Guide

**MBP6KiG2**
**MBP11KiG2**

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English

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# 1 Safety instructions

**SAVE THESE INSTRUCTIONS. This manual contains important instructions that should be followed during installation and maintenance of the MBP and UPS.**

The HotSwap MBP models that are covered in this manual are intended for installation in an environment within 0 to 40°C, free of conductive contaminant.
This equipment has been tested and found to comply with Class A UPS, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely
to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Safety of persons**

- The system has its own power source when connected to the UPS (UPS battery). Consequently, the power outlets may be energized even if the system is disconnected from the AC power source. Dangerous voltage levels are present within the system.
- It should be opened exclusively by qualified service personnel.
- The product must be properly grounded, always connect the earth wire first

**Product safety**

- The MBP connection instructions and operation described in the manual must be followed in the indicated order. Disconnection and overcurrent protection devices shall be provided by others for AC in/out circuits.
- CAUTION - To reduce the risk of fire, the unit connects only to a circuit provided with branch circuit overcurrent protection (please refer to the UPS User Manual for current rating). The upstream circuit breaker must be easily accessible.
- The unit can be disconnected from AC power source by opening this circuit breaker, and if still connected to UPS, by previously shutting down the UPS (refer to the UPS User Manual)
- Check that the indications on the rating plate correspond to your AC powered system and to the actual electrical consumption of all the equipment to be connected to the system.
- Never install the system near liquids or in an excessively damp environment.
- Never let a foreign body penetrate inside the system.
- Never expose the system to direct sunlight or source of heat.
- If the system must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -15ºC to +60ºC.

**Special precautions**

- The HotSwap MBP is designed to work with approved EATON UPS (contact your Eaton reseller for more information)
- All repairs and service should be performed by AUTHORIZED SERVICE PERSONNEL ONLY. There are NO USER SERVICEABLE PARTS inside the MBP.

# 2 Special symbols

The following are examples of symbols used on the UPS or accessories to alert you to important information:

**DANGER:** Dangerous voltage levels are present within the UPS. The UPS has its own internal power source (the battery). Consequently, the power outlets may be energized even if the UPS is disconnected from the AC power source.

Important instructions that must always be followed.
**CAUTION:** Batteries present a risk of energy or electrical shock or burn from high short circuit current. Observe proper precaution. Batteries may contain HIGH VOLTAGE and CORROSIVE, TOXIC and EXPLOSIVE substances.

Information, advice, help.

Read the documentation provided.

This equipment should only be used in a dry indoor environment.

Operating range of temperature.

Operating range of humidity.

The UPS and their batteries must be kept in a ventilated place.

# 3 Introduction

Thank you for selecting an EATON product to protect your electrical equipment. The HotSwap MBP range has been designed with the utmost care.

We recommend that you take the time to read this manual to take full advantage of the many features of your MBP (Maintenance Bypass).

Before installing your HotSwap MBP with your UPS, please read first the safety instructions.

Then follow the indications in this manual, which completes the UPS Installation and User Manual.

To discover the entire range of EATON products, we invite you to visit our web site at www.eaton.com/ powerquality or contact your EATON representative

## 2.1 Environmental protection

Eaton has implemented an environmental-protection policy. Products are developed according to an eco-design approach.

### Substances

This product contains no CFC, HCFC or asbestos. This product is compliant with regulations on the restriction of the use of substances in electrical and electronic equipment.

### Packaging

To improve waste treatment and facilitate recycling, separate the various packing components.

- Packing materials are recyclable and bear the appropriate identification symbol.

- The cardboard we use comprises over 50% of recycled cardboard.
- Plastic bags are made of polyethylene

| **Materials** | **Abbreviations** | **Number in the symbols** |
|---|---|---|
| Polyethylene terephthalate | PET | 01 |
| High-density polyethylene | HDPE | 02 |
| Polyvinyl chloride | PVC | 03 |
| Low-density polyethylene | LDPE | 04 |
| Polypropylene | PP | 05 |
| Polystyrene | PS | 06 |



Follow all local regulations for the disposal of packing materials.

### End of life

Eaton will process products at the end of their service life in compliance with local regulations. Eaton works with companies in charge of collecting and eliminating our products at the end of their service life.

### Product

The product is made from materials that can be recycled. Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a processing center for electrical and electronic waste. eaton.com/recycling

## 2.2 Benefits

The Eaton® HotSwap MBP module makes it possible to service or even replace the UPS without affecting the connected loads (HotSwap function).

You can safely eliminate the effects of UPS maintenance and guard the integrity of your equipment.

Providing outstanding reliability, the Eaton HotSwap MBP unique benefits include:

- Easy and fast connection to UPS due to Input/Output and signal “all in one” patented connector (Hotswap MBP 5/6kVA range)
- “**make before break**” feature to allow full servicing (electrical power continuity) when switching from UPS position to Bypass (and vice versa)
- Communication feature with UPS: detection of MBP connection and switch position (Normal or Bypass)
- Load connection by both terminal blocks and NEMA outlets (30 A L6-30P on 11k MBP and 20 A L6-30P on 6k MBP )
- Adjustable 19’’ Rack kit and multiple positions Tower installation kit provided
- Backed by worldwide agency approvals.

# 4 Presentation

The HotSwap MBP has a manual Bypass rotary switch with two positions:

- **UPS =>** the load is supplied by the UPS
- **Bypass =>** the load is supplied directly by the AC power source

2 lights indicate the Hotswap MBP power status:

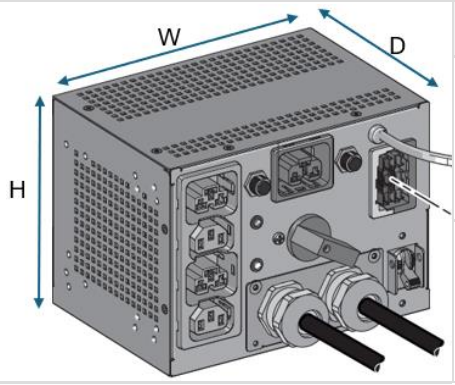
- **"UPS supply"** green light: when active, the UPS output is available, the Bypass switch can be safely turned to UPS position
- **"Bypass mode"** red light: when active, indicates that the Hotswap MBP is on "Bypass mode" (Bypass switch turned to Bypass position)

**Normal AC source switch:**
Allow to safely switch off the AC source of the UPS, for UPS maintenance / replacing

**MBP status detection:**
A signal cable, with RJ11 connector to plug to the UPS, allows the communication to the UPS to manage the MBP status, and the indication on UPS display panel of both following status:

- MBP connection to UPS
- Bypass switch position

## 4.1 Weights and dimensions

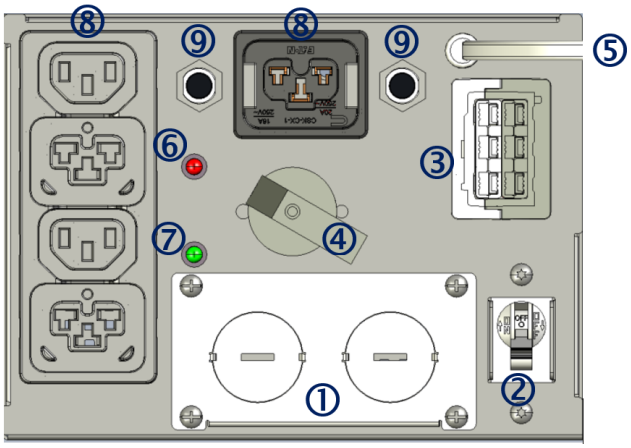



| Description (MBP) | Weights (kg / lb) | Dimensions (mm / inch) D x W x H |
|---|---|---|
| MBP6KIG2 | 2.0 / 4.4 | 125x177x130 / 4.9x7.0x5.1 |
| MBP11KIG2 | 4.6 / 10.1 | 285x130x130 / 11.2x5.1x5.1 |

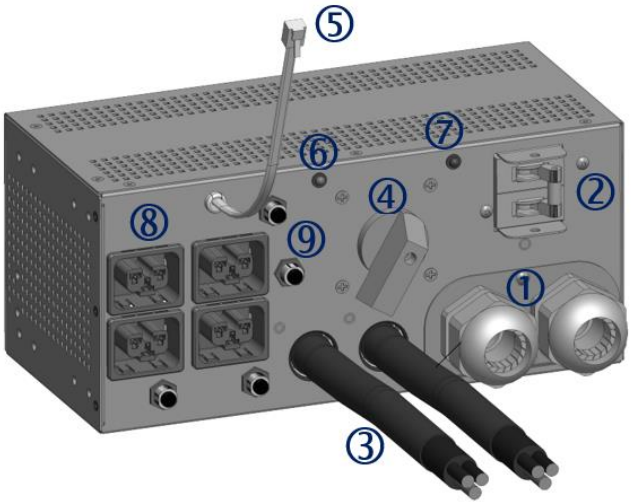
## 4.2 Rear Panel

**MBP rear panels**

**MBP6KiG2**




**MBP11KiG2**




① Input/Output terminal blocks

② Normal AC source switch

③ Input/Output to UPS

④ Manual Bypass switch

⑤ MBP-Detection connector to the UPS

⑥"Bypass" mode red light

⑦ UPS supply green light

⑧ Sockets:
MBP6KiG2: 1 x C39 + 1 gang of 2 x C39 & 2x C13
MBP11KiG2: 4 x C39

⑨Breakers

# 5 Installation

## 5.1 Inspecting the equipment: MBP package content

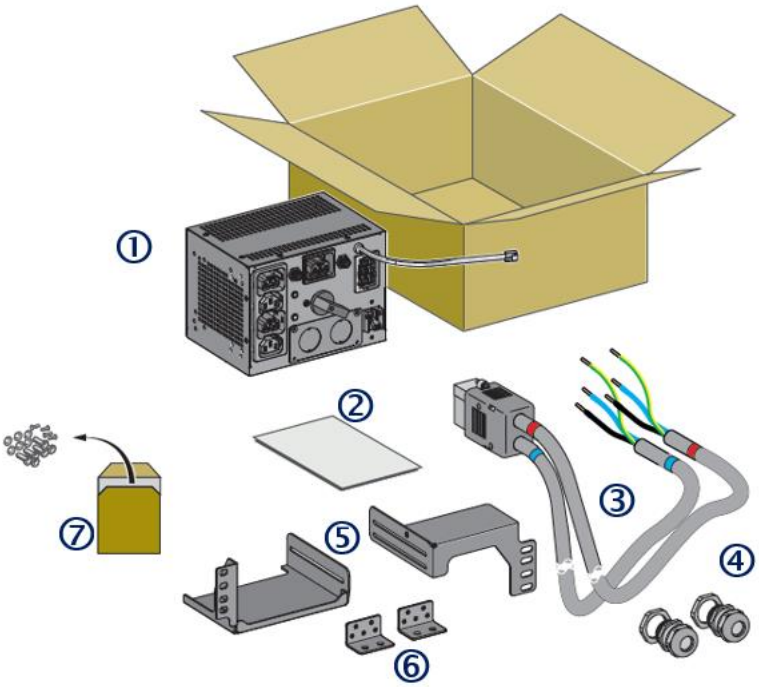
If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

To file a claim for shipping damage or concealed damage:

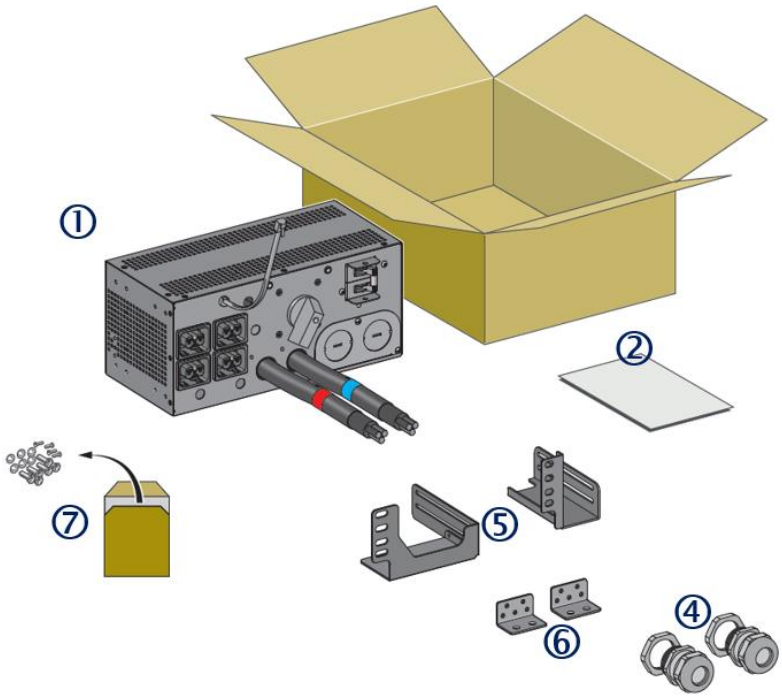
1. File with the carrier within 15 days of receipt of the equipment
2. Send a copy of the damage claim within 15 days to your service representative

Verify that the following items are included with the MBP:

**MBP6KiG2**




**MBP11KiG2**




① MBP

② Quick start

③ MBP Cord set (Only for 6k MBP)

④ Cable glands

⑤ Ears for rack mounting

⑥ MBP fixation ears

⑦ Kraft envelop with screws

## 5.2 MBP connection to UPS

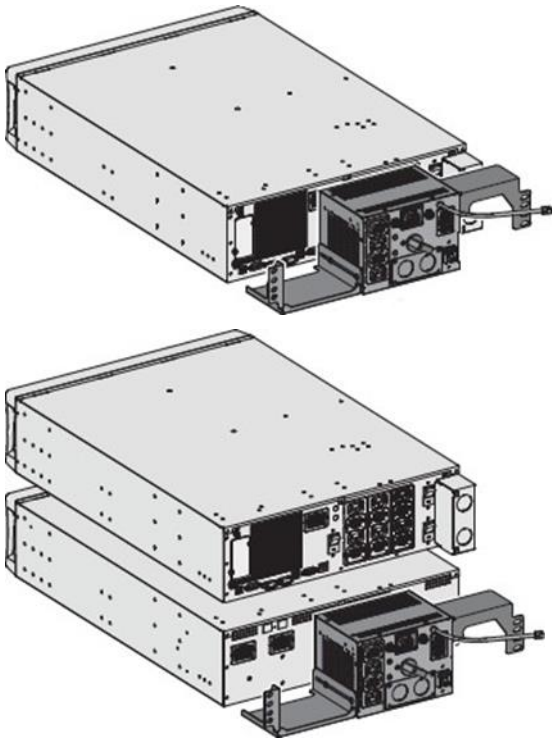
Note: In the configuration "UPS + EBM", the MBP must be mounted at the back of EBM.

### Mechanical installation in rack position

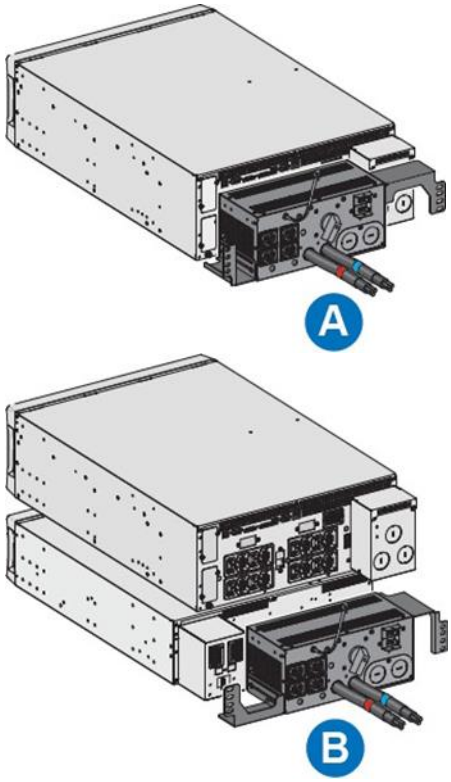
For the MBP used with 8000VA and 11000VA UPS, depending on the configuration, there are two different assemblies, identified with letters A (UPS only) and B (UPS+EBM)

Final assembly position:

MBP6KiG2 used with 5000VA and 6000VA UPS



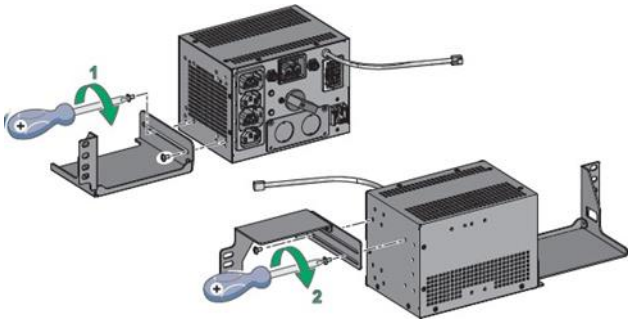
MBP11KiG2 used with 8000VA and 11000VA UPS



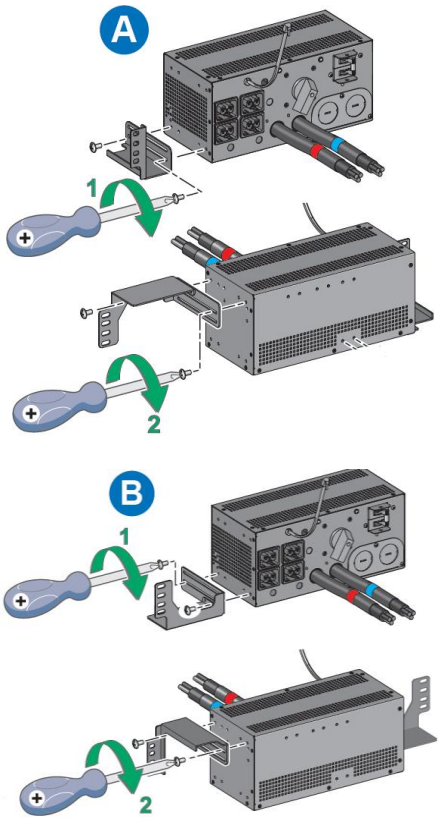
Follow the steps below to install the MBP in rack position.

1. Screw the ears on each MBP side.

MBP6KiG2 used with 5000VA and 6000VA UPS

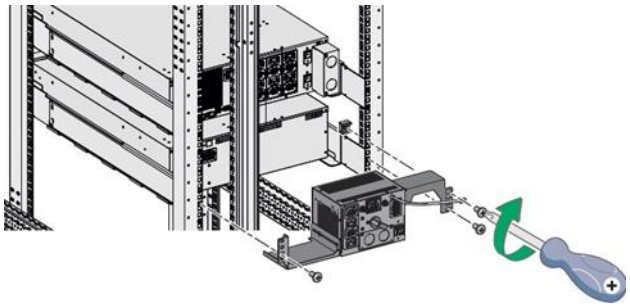



MBP11KiG2 used with 8000VA and 11000VA UPS

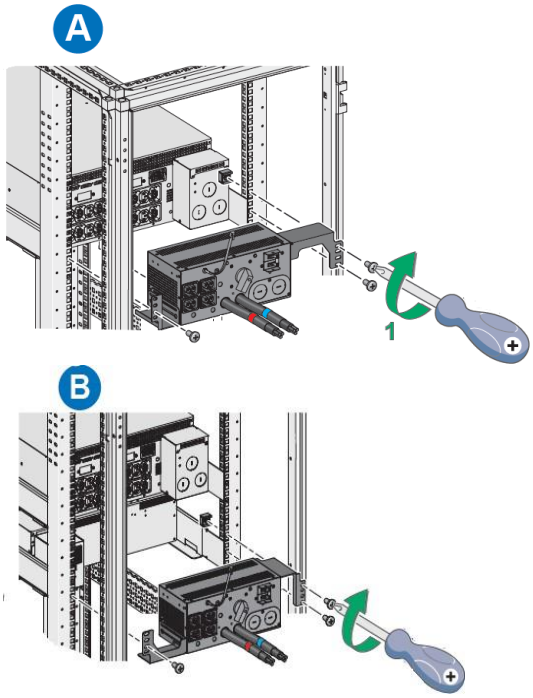



2. Mount the MBP with its ears on the UPS rack.

MBP6KiG2 used with 5000VA and 6000VA UPS



MBP11KiG2 used with 8000VA and 11000VA UPS



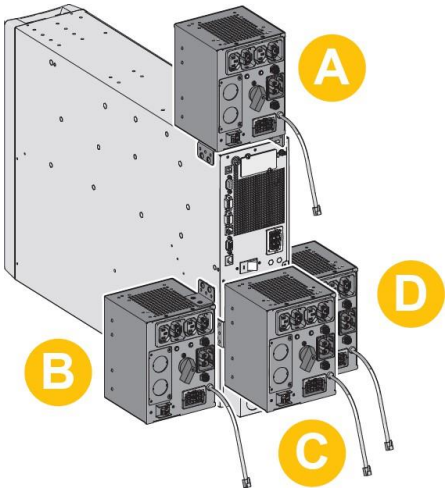
## Mechanical installation in tower position

Depending on the configuration, there are four different assemblies, identified with letters A, B, C and D.

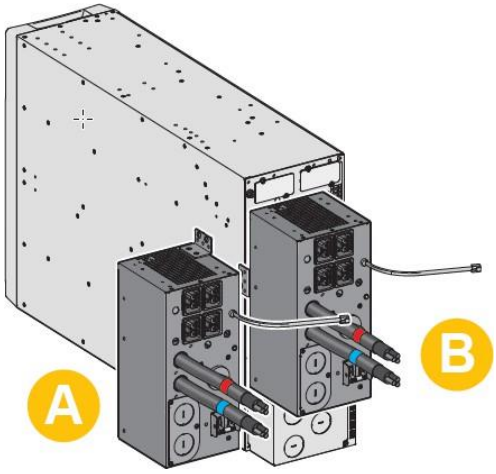
The different ways to mount the MBP with the UPS or the "UPS+EBM" are identified by the A, B, C & D letters.

Final assembly position:

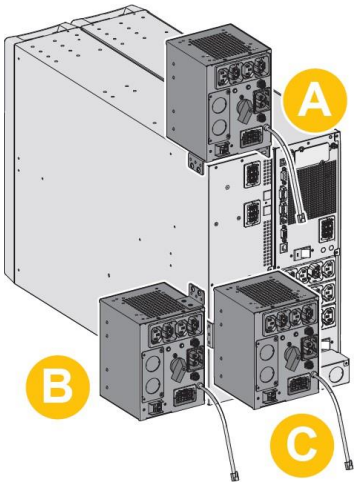
MBP6KiG2 used with 5000VA and 6000VA UPS



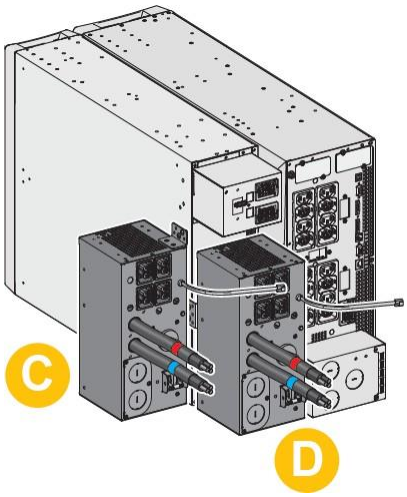

MBP11KiG2 used with 8000VA and 11000VA UPS




MBP6KiG2 used with 5000VA and 6000VA UPS + 180V EBM



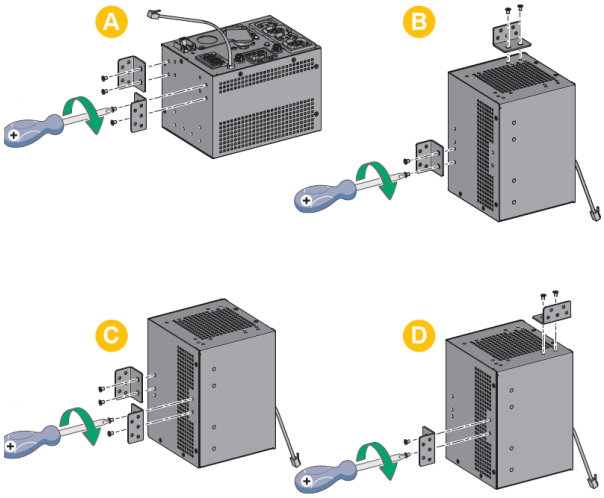

MBP11KiG2 used with 8000VA and 11000VA UPS + 240V EBM



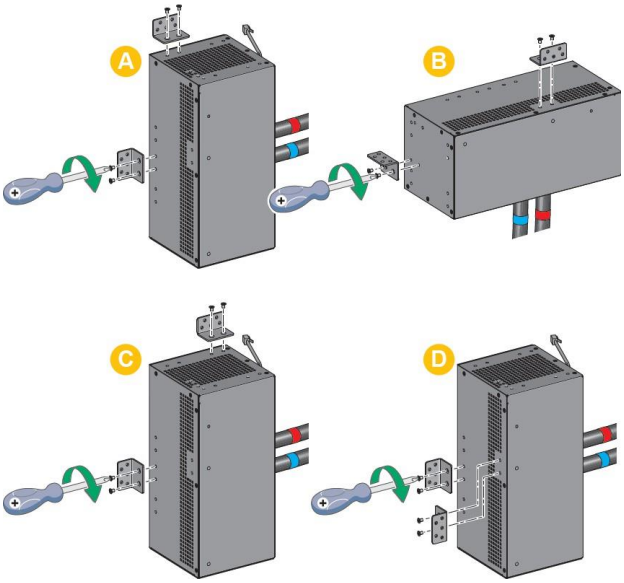
Follow the steps below to install the MBP in tower position.

Screw the ears on each MBP side.

MBP6KiG2 used with 5000VA and 6000VA UPS

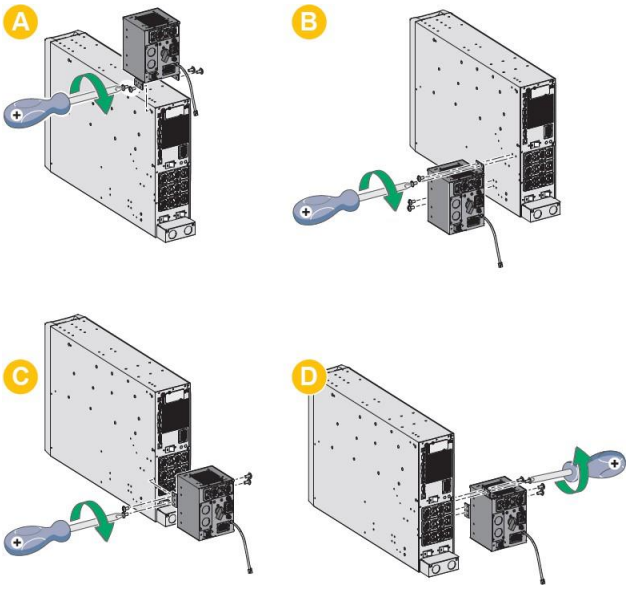



MBP11KiG2 used with 8000VA and 11000VA UPS

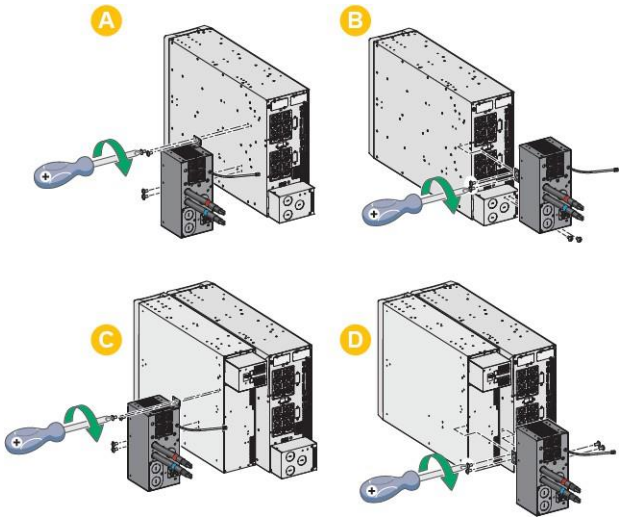



Mount the MBP with its ears on the UPS or EBM

MBP6KiG2 used with 5000VA and 6000VA UPS




MBP11KiG2 used with 8000VA and 11000VA UPS

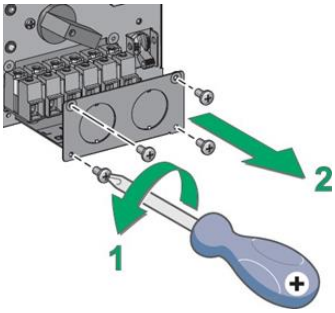


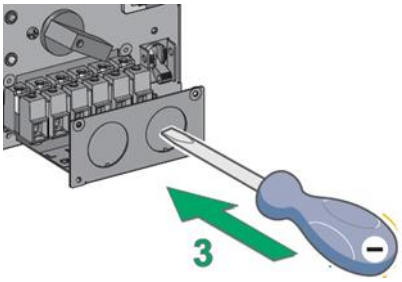
## MBP electrical connection

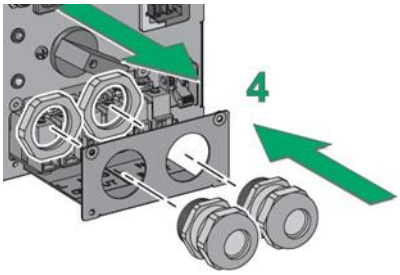
Caution: Manually trip the input circuit breaker of your installation before connecting the supply cables.

Access to the terminal block, remove the circular covers and screw the cable glands.

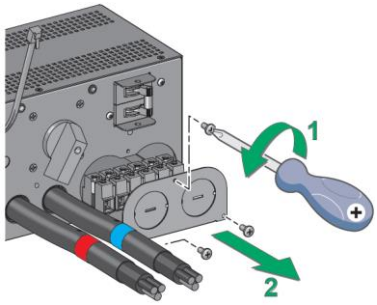
MBP6KiG2 used with 5000VA and 6000VA UPS

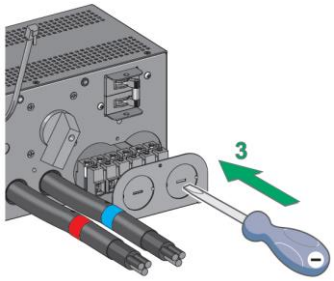


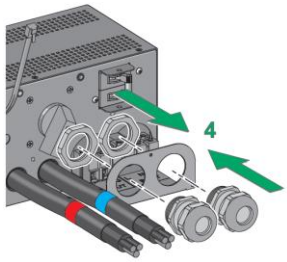




MBP11KiG2 used with 8000VA and 11000VA UPS



Insert the electrical cables.

Follow below instructions for upstream protection and cable cross section.

Use copper cable only, and not aluminum.

## Recommended upstream protection

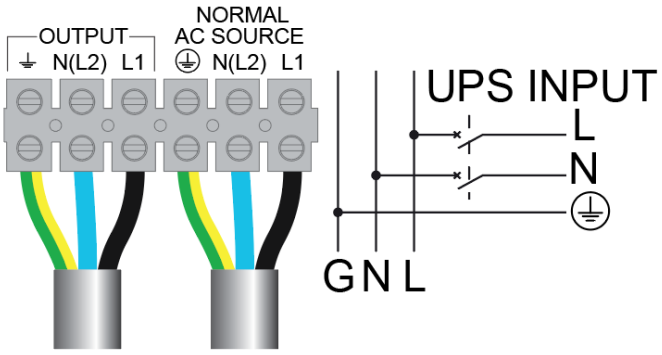
The upstream circuit breaker for Normal AC/Bypass AC must be easily accessible. The unit can be disconnected from AC power source by opening this circuit breaker.

| **UPS power rating** | **Upstream circuit breaker (CB)** |
|---|---|
| 5000VA | D curve 2 poles – 32A |
| 6000VA | D curve 2 poles – 40A |
| 8000VA | D curve 2 poles – 50A |
| 11000VA (Standard installation*) | D curve 2 poles – 63A |
| 11000VA (Advanced installation) | D curve 2 poles – 80A |

Do not use 30 mA RCD/ELCB breaker upstream the UPS.

*If the UPS load is less than 90%; Or the total battery Ah less than 20Ah, the UPS will limit the charger current to 4A (0.2*20 = 4A), in this case, you could select the 70A (in US/CSA)/ 63A(others) upstream circuit breaker. (these conditions are not certificated)

## Recommended cable cross-sections for standard installation

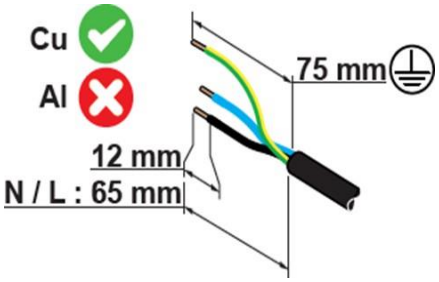



| **Configuration** | **Minimum input wire size** | | | **Minimum output wire size** | | | **Min Tightening torque** | **Terminal wire size rating** |
|---|---|---|---|---|---|---|---|---|
| | **L1** | **N(L2)** | ⏚ | **L1** | **N(L2)** | ⏚ | | |
| 9PX5KIRTNG2 + MBP6KIG2 | 6 mm²*/ 10 AWG | | | 6 mm² / 10 AWG | | | 16 lb-in | 16 mm² / 6AWG |
| 9PX6KIRTNG2 + MBP6KIG2 | 6 mm² / 8 AWG | | | 6 mm² / 8 AWG | | | | |
| 9PX8KIRTNG2+ MBP11KIG2 | 10 mm²* / 6 AWG | | | 10 mm² / 8 AWG | | | 22 lb-in | 25 mm² / 4AWG |
| 9PX11KIRTNG2+ MBP11KIG2 | 10 mm²* / 4 AWG | | | 10 mm² / 6 AWG | | | | |

* **High leakage current**, the minimum cross-section of protective earthing conductor of 10mm² Cu shall be selected.

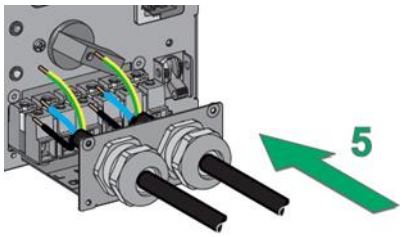
Note: For Supply connections, use wires suitable for at least 90°C copper or equivalent.
AWG used in US/CSA, mm² used in others

⚠ Strip the copper supply cable keeping the Earth cable longer for safety purpose.

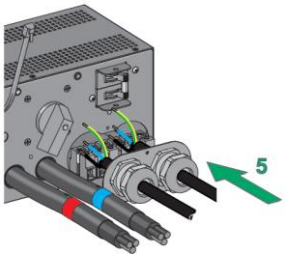



Insert the cables

MBP6KiG2 used with 5000VA and 6000VA UPS

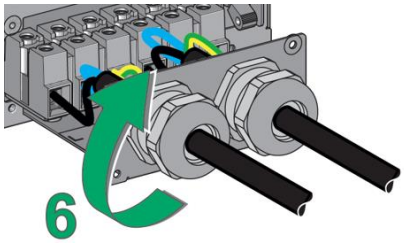



MBP11KiG2 used with 8000VA and 11000VA UPS

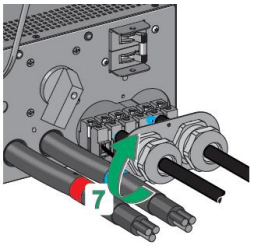



Tighten well the cable glands

MBP6KiG2 used with 5000VA and 6000VA UPS

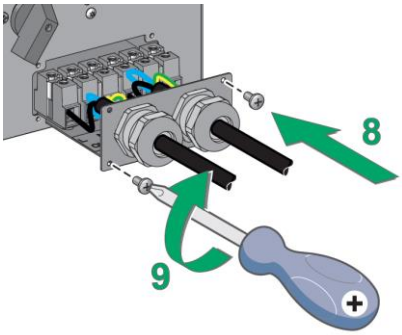



MBP11KiG2 used with 8000VA and 11000VA UPS

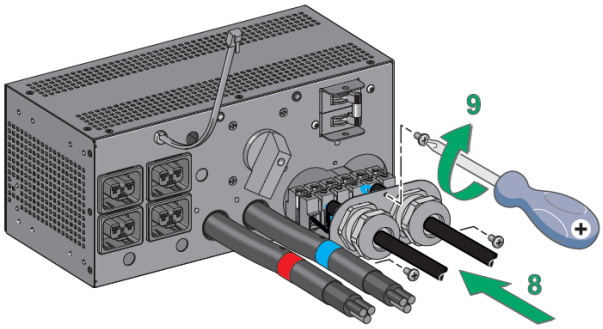



Close the I/O box terminal

MBP6KiG2 used with 5000VA and 6000VA UPS



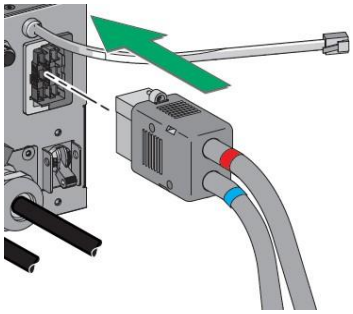

MBP11KiG2 used with 8000VA and 11000VA UPS



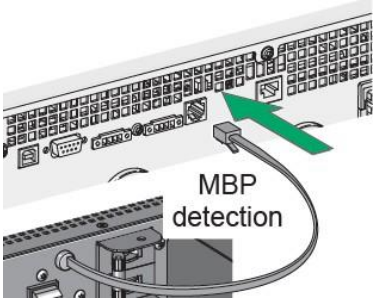
## Connection between MPB and UPS

⚠ For the electrical connection on the UPS side, follow the steps described in the chapter "Hardwired connection"

Connect the MBP cord set (For 6k MBP only)

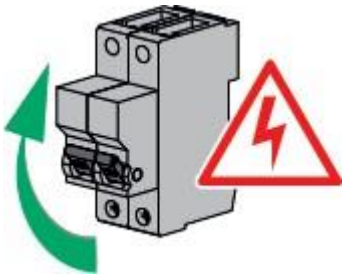


Connect the MBP detection cable to the UPS




## Power up your installation

Switch on the input circuit breaker of your installation. The installation is powered up and can be used.



## HotSwap MBP module test

Set Manual Bypass switch to Bypass position and check that the load is still supplied.

Set Manual Bypass switch back to Normal position.

# 6 Operation

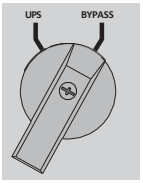
## 6.1 UPS start-up with HotSwap MBP

Verify that the total equipment ratings do not exceed the UPS capacity to prevent an overload alarm.

1. Check that the UPS is correctly connected to the HotSwap MBP.

**If the UPS if equipped with outlets**, those outlets can no longer be used (loads can only be connected to the MBP outlets or the MBP Output terminal blocks

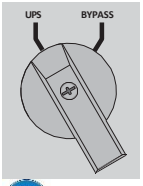
2. Verify that the MBP terminal blocks are connected to the AC source.
3. Check that the MBP manual Bypass switch is to the "**Bypass" position**.




4. Set the upstream circuit breaker (not provided) to the “I” (On) position to switch on the utility power.
5. Verify that the "Bypass mode" red light of the MBP goes On, indicating that the load is now powered by the AC source.
6. Set the Normal AC source switch of the MBP to the “I” (On) position.
7. For the following steps, refer to the UPS User Manual :
8. Verify that the UPS is correctly powered (UPS display panel illuminates)
    a. Press the UPS **"ON"** button to start the UPS.
    b. Put the UPS in **“Bypass mode”** (“Control -> Go to bypass”).
    c. Verify that the UPS is on Bypass mode by checking UPS display panel.
9. Verify that the **"UPS mode" green light** of the MBP goes On, indicating that the UPS output power is available on the MBP.

**Important: do not continue to next step if the "UPS mode" green light of the MBP is still Off (the load will be lost).**

10. Set the MBP manual Bypass switch to the **"UPS" position**: the **"Bypass mode" red light** of the MBP goes Off, indicating that the load is now powered by the UPS.




11. For the following steps, refer to the UPS User Manual :
    a. Put the UPS in "**Normal mode**". (“Control -> Go back normal”)
    b. Check that the UPS is in Online mode by checking UPS display panel. The load is now protected by the UPS.

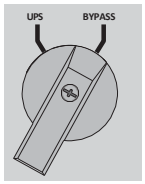
# 7 UPS maintenance with HotSwap MBP

## 7.1 UPS replacement with HotSwap MBP

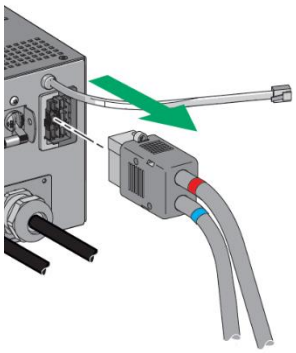
UPS Removing (please follow the MANDATORY step below).

UPS replacement must be performed by qualified person only.

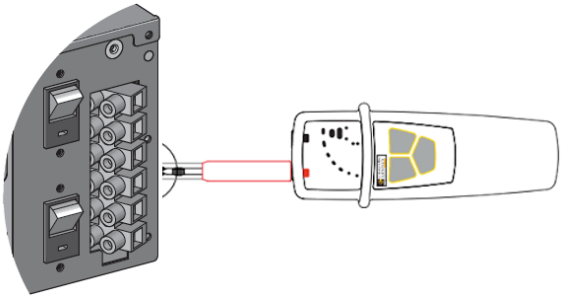
### MBP6KiG2




1. For the following steps, refer to the UPS User Manual :
   - Put the UPS in "**Bypass mode**" ("Control -> Go to bypass").
   - Verify that the UPS is on Bypass mode by checking UPS display panel
2. Set the MBP manual Bypass switch to "Bypass" position. The "Bypass mode" red light of the MBP goes On, indicating that the load is supplied directly by AC source
3. Switch the Normal AC source switch of the MBP to the "0" (Off) position and wait 30 seconds
4. UPS stops, the UPS can now be disconnected, as described below:
   - First disconnect the I/O cord Set (1) from the MBP,



- After opening the UPS I/O terminal blocks cover, check if hazardous voltage is no longer present on UPS terminal blocks by using an electrical safety tester.

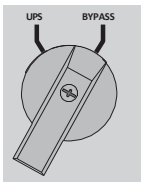


- Disconnect the 2 power cables of the MBP I/O cord Set, and the MBP detection cable,
- Replace the UPS.

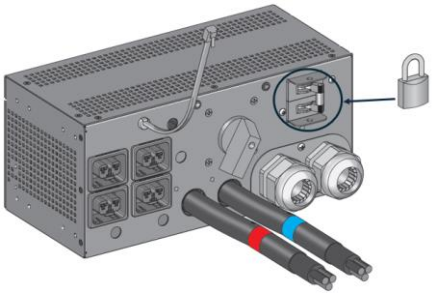
Hazardous voltage and lost load risk: do not manipulate the MBP manual Bypass switch without UPS connected via the I/O cord Set.

## MBP11KiG2:

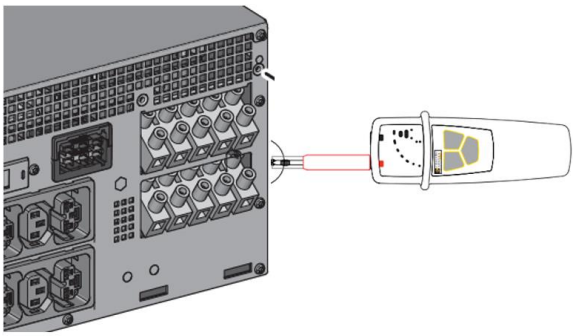
UPS replacement must be performed by qualified person only.



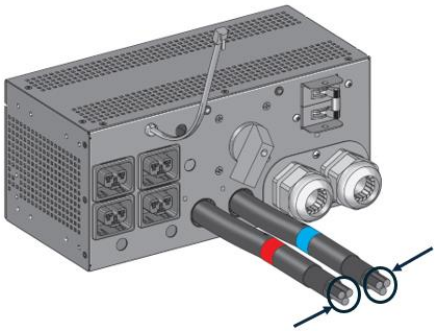

1. For the following steps, refer to the UPS User Manual :
   - Put the UPS in “Bypass mode” (“Control -> Go to bypass”).
   - Verify that the UPS is on Bypass mode by checking UPS display panel
2. Set the MBP manual Bypass switch to "Bypass" position. The "Bypass mode" red light of the MBP goes On, indicating that the load is supplied directly by AC source
3. Switch the Normal AC source switch of the MBP to the “0” (Off) position and wait 30 seconds
4. UPS stops, the UPS can now be disconnected, as described below:
   - First lock the Normal AC source switch of the MBP to the “0” (Off) position (the switch protection frame can fit a cable tie or a metallic locker).



- After opening the I/O terminal blocks cover of UPS, check if hazardous voltage is no longer present on UPS terminal blocks by using an electrical safety tester



- Disconnect the MBP conduits, and the MBP detection cable
- On both MBP conduits just disconnected from the UPS, link the internal wires together (line 1 and line 2 wires linked to ground wire)



- Replace the UPS

Hazardous voltage and lost load risk: do not manipulate the MBP manual Bypass switch without UPS connected to the MBP power conduits.

## Return to normal operation:

1. Check that the new UPS is correctly connected to the MBP, as described below:

### MBP6KiG2:

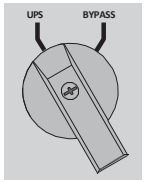
- After opening the UPS I/O terminal blocks cover, connect to UPS the 2 power cables, and the MBP detection cable, of the MBP I/O cord Set
- Connect the I/O cord Set connector to the MBP.

### MBP11KiG2:

- First check that the Normal AC source switch of the MBP is still locked to the "0" position
- Remove the previously installed safety wires links on both MBP conduits
- After opening the UPS I/O terminal blocks cover, connect to UPS the MBP conduits, and the MBP detection cable
- Unlock the Normal AC source switch of the MBP

2. Set the Normal AC source switch of the MBP to the "I" (On) position.
3. For the following steps, refer to the UPS User Manual
   - Verify that the UPS is correctly powered (UPS display panel illuminates)
   - Press the UPS **"ON"** button to start the UPS
   - Put the UPS in "**Bypass mode**" ("Control -> Go to bypass")
   - Verify that the UPS is on Bypass mode by checking UPS display panel
4. Verify that the **"UPS mode" green light** of the MBP goes On, indicating that the UPS output power is available on the MBP.

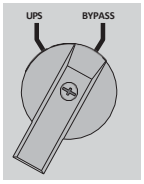
**Important:** do not continue to next step if the **"UPS mode" green light** of the MBP is still Off (the load will be lost)




5. Set the **MBP** manual Bypass switch to the **"UPS" position**: the **"Bypass mode" red light** of the MBP goes Off, indicating that the load is now powered by the UPS
6. For the following steps, refer to the UPS User Manual
   - Put the UPS in **"normal mode"**
   - Check that the UPS is in Online mode by checking UPS display panel the load is now protected by the UPS

## 7.2 UPS maintenance with HotSwap MBP

### Go to maintenance Bypass operation (please follow the MANDATORY steps below):

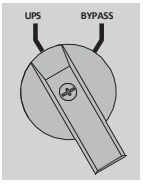



1. For the following steps, refer to the UPS User Manual
   - Put the UPS in **" Bypass mode"**
   - Verify that the UPS is on Bypass mode by checking UPS display panel
2. Set the MBP manual Bypass switch to "Bypass" position. The "Bypass mode" red light of the MBP goes On, indicating that the load is supplied directly by AC source
3. Proceed to maintenance operations on UPS

### Return to normal operation:

1. Verify that the UPS is on Bypass mode by checking UPS display panel
2. Verify that the **"UPS mode" green light** of the MBP is On, indicating that the UPS output power is available on the MBP

**Important:** do not continue to next step if the **"UPS mode" green light** of the MBP is Off (the load will be lost)




3. Set the MBP manual Bypass switch to the **"UPS" position**: the **"Bypass mode" red light** of the MBP goes Off, indicating that the load is now powered by the UPS
4. Put the UPS in **"normal mode"**
5. Check that the UPS is in Online mode by checking UPS display panel the load is now protected by the UPS.

# 8 Specification and technical characteristics

| | MBP6KiG2 | MBP11KiG2 |
|---|---|---|
| **Input** | | |
| | Terminal blocks | |
| **Input Bypass** | | |
| | N/A | Terminal Blocks |
| **Output** | | |
| | 1 x C39 + 1 gang of 2 x C39 & 2x C13<br>Terminal blocks | 4 x C39<br>Terminal blocks |
| **Overall dimensions** D x W x H (**mm** / inch) | | |
| | **125x177x130**<br>4.9x7.0x5.1 | **285x130x130**<br>11.2x5.1x5.1 |
| **Weight** (**kg** / lb) | | |
| | **2.0** / 4.4 | **4.6** / 10.1 |
| **Performance** | | |
| Nominal voltage | 200 - 240 V ~ | 200 - 240 V ~ |
| Frequency | 50/60 Hz | |
| Input nominal current | 30A | 50A |
| Maximal power | 6000 VA | 11000 VA |
| **Standards (HotSwap MBP used with UPS)** | | |
| For the standards, refer to the §9.8 “Environmental and safety” of the UPS user manual | | |
| **Marking** | | |
| | CE | |
| **Environment** | | |
| Operating temperature | 0 to 40°C (32 to 104°F) | |
| Storage temperature | -15 to 60°C (5 to 140°F) | |
| Transit temperature | -25 to 55°C (-13 to 130°F) | |
| Humidity | 0 to 95% no condensing | |
| Operation Altitude | Up to 3,000 meters (9,842ft) above sea level (without derating). | |
| Transit Altitude | Up to 10,000 meters (32,808 ft) above sea level | |