# User and Installers Guide - Softwired Maintenance Bypass Switches for EATON 9130 and 9125 UPS


## Instruction Manual

6M1001Brev7
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Made in Australia

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# QUICK START INSTALLATION GUIDE

****FIRST ENSURE THAT MAINS SUPPLY IS ISOLATED AND ALL CIRCUIT BREAKERS ARE SWITCHED OFF.****

Please read the following instructions carefully. Refer also to Figures 5 & 6 under Section 7: Installation for details on connection, and Figures 7 & 8 for UPS plug and socket-outlet locations.

1. Mount the MBS enclosure on a wall in a suitable location for safe and convenient operation. Keyholes have been provided for this purpose at the top and bottom of the switch.

2. Remove the linked plug from the “Inverter Shutdown” (“Force to Bypass” X5 for 9130) socket on the UPS rear panel and replace with the Inverter Interlock cable supplied. Route cable to the socket marked “Inverter Interlock” on the Maintenance Bypass Switch. Ensure that the plug connected to the UPS socket is fixed securely using the screws on the plug. 3kVA MBS units also require plug screws on the MBS socket to be secured.

3. Using the IEC Male / IEC Female cable supplied, connect plug on the UPS marked “INPUT” to the socket-outlet on the MBS marked “TO UPS INPUT”. (Cable is rated for 10A with 700VA – 2.2kVA UPS, and 15A for 3kVA UPS). Refer to Fig. 5 & 6 for further details.

4. Using the Australian Plug / IEC Female cable supplied, connect the UPS socket-outlet marked “LOAD SEGMENT 1” to the MBS plug marked “FROM UPS OUTPUT”. (Cable is rated for 10A with 700VA – 2.2kVA UPS, and 15A for 3kVA UPS). Refer to Fig. 5 & 6 for further details.

5. Connect the load cables to the load socket-outlets on the MBS. (700VA – 2.2kVA MBS units will accept 2 x 10A Australian Standard Mains plugs and 3kVA units will accept 2x 10A or 15A Plugs.) Refer to Fig. 5 & 6 for further details.

6. **ENSURE MAINS SUPPLY IS SWITCHED OFF FIRST.** Then connect AC Mains Supply to the socket of the MBS marked “MAINS INPUT” with the power cable supplied with UPS.

7. Rotate switch to “Normal” position.

8. Turn AC Mains on.

9. Turn UPS on, by pressing the UPS front panel pushbutton. Check load is operating satisfactorily.

10. Test that the UPS will transfer to bypass successfully, by rotating MBS switch from “Normal” to “Bypass” position. The UPS LED indicator will show “UPS Off” and the UPS will shutdown. Load should continue to operate without interruption, however, will fail in the event of AC Mains failure.

11. To initiate the UPS Restart operation, rotate the switch from “Bypass” position to “Restart” position. AC Mains is now being fed to UPS. Turn the UPS on with the front panel pushbutton as per UPS manual. The UPS display should now indicate “Bypass Mode”. Once the UPS is in “Bypass Mode”, it is safe to switch over to “Normal” position on the MBS. After a short delay, the UPS will switch over to “Online Mode” and the UPS will now the protect critical load against any AC Mains failure.

Congratulations on the purchase of your Eaton Maintenance Bypass Switch. This switch has been specifically designed to operate in conjunction with your Eaton UPS, ensuring seamless operation of your critical load during maintenance and testing, or in the unlikely event of equipment failure.

Please take the time to read these instructions carefully, and ensure they are at hand at all times.

# 1.0 IMPORTANT SAFETY NOTICES

## CAUTION

UPS are capable of supplying dangerous voltages even when turned off. Before attempting to install this Maintenance Bypass Switch the UPS must be completely switched off and removed from supply - battery isolated (where appropriate), and the mains supply must also be isolated.

Failure to properly install the Maintenance Bypass Switch may result in severe damage to your UPS.

# 2.0 INTRODUCTION

The purpose of a Maintenance Bypass Switch (MBS) is to isolate all AC input and output supplies from a UPS to allow maintenance technicians to safely work on the equipment, while the critical load equipment continues to be powered from the input supply, normally raw mains, without interruption.

DC supplies are not disconnected by the MBS as they are fitted with their own specialised isolators.

All MBS feature an electrical/mechanical interlock to prevent UPS damage due to improper switch operation.

# 3.0 SELECTION GUIDE – MAINTENANCE BYPASS SWITCHES

| UPS Rating | Switch Part No. | Max. Input Current (A) |
|---|---|---|
| 700VA - 2200VA | MBS2000SW1 | 10 A |
| 3000VA | MBS3000SW1 | 16 A |

**Table 1: Maintenance Bypass Switches Selection**

# 4.0 DESCRIPTION OF OPERATION

Eaton Maintenance Bypass Switches feature 3 positions, at the 10 O'Clock, 12 O'Clock, and 2 O'Clock positions. The function of each position is described below.

**Note**: Figures 1-4 are for descriptive purposes only, for specific wiring, please refer to the relevant wiring diagram at the back of the manual.

**"Normal" (10 O'Clock)**
In the "Normal" position the UPS is fed from the AC Mains supply and the load equipment is fed from the output of the UPS. In this position the critical load is protected by the UPS. (See Fig 1)

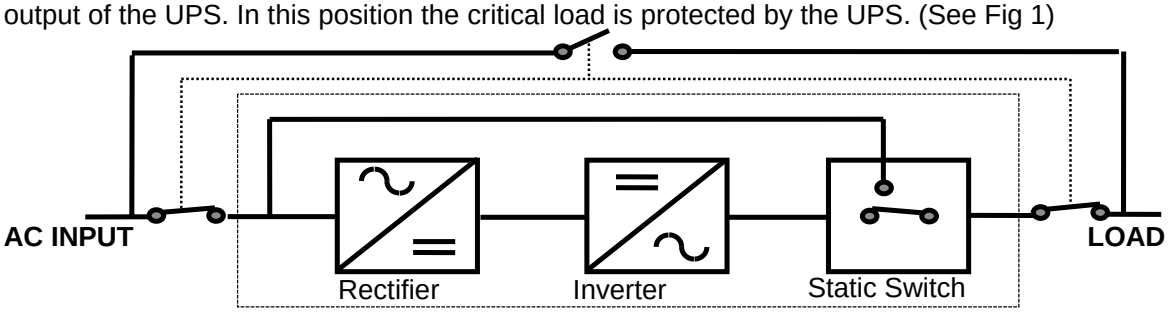


**Figure 1: MBS in "Normal" Mode**

**"Restart" (12 O'Clock)**
The "Restart" position connects the load equipment directly to raw AC Mains supply. AC input power is also fed to the UPS to enable it to power up. The output of the UPS is disconnected from the load equipment and the critical load is not protected by the UPS. (See Fig. 2)

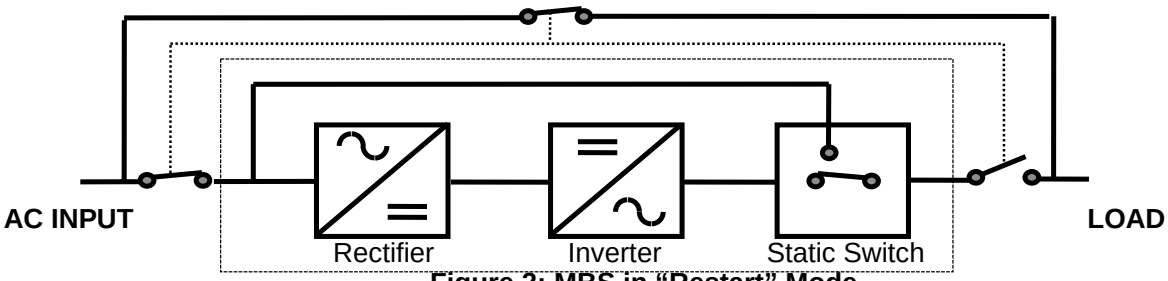


**Figure 2: MBS in "Restart" Mode**

**"Bypass" (2 O'Clock)**
The "Bypass" position connects the load equipment directly to raw AC Mains supply. AC input power is disconnected from the UPS to facilitate maintenance or component replacement. The critical load is not protected by the UPS. In this position the entire UPS can be removed or replaced wit hout disturbing the load equipment. (See Fig. 3)

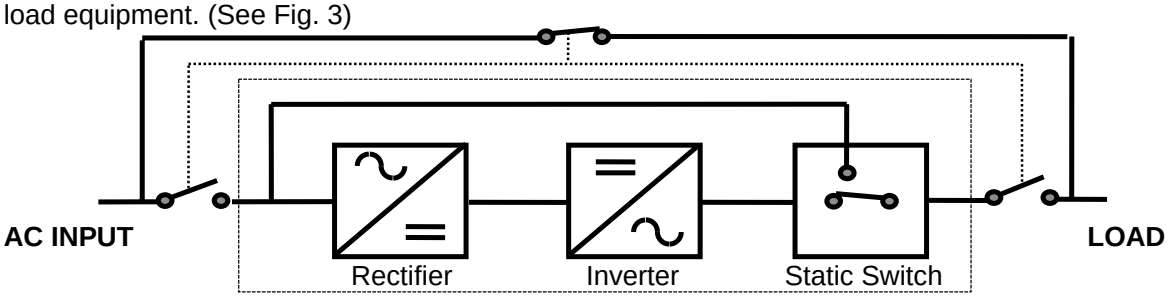


**Figure 3: MBS in "Bypass" Mode**

# 4.0 Description of Operation [cont'd]

The Maintenance Bypass Switch is a **Make Before Break** type switch, or **MBB** for short. This type of switch provides continuity of supply to the load when switching between positions. Load supply continuity is achieved by overlapping the opening and closing of input and output switch contacts when switching between positions.

This means that the input supply voltage and output supply are connected together momentarily when switching between the adjacent "Normal" and "Restart" positions. When used on a double conversion type UPS the inverter must be off and the load fed from the UPS bypass, or inverter damage is highly probable.

To ensure that the inverter is not damaged, all Eaton MBS feature an interlock to ensure the inverter is turned off automatically when the MBS is moved between positions. This interlock takes the form of a normally closed circuit which opens when the switch is moved from "Normal" towards "Restart". The inverter will not operate in "Restart" and "Bypass" mode.

The Eaton 9130 and 9125 UPS, for which this Maintenance Switch is intended, incorporates an inverter shutdown connection, located in the rear of the UPS.

# 5.0 OPERATING THE MAINTENANCE BYPASS SWITCH

## NORMAL OPERATION

To power the critical load from the UPS, ensure the switch is in "Normal" position. The UPS will operate in accordance with specifications as per UPS manual.

## BYPASS OPERATION

To power the critical load directly from AC Mains, rotate the switch from "Normal" position to "Bypass" position. The UPS LED indicator will show "UPS Off" and the UPS will shutdown. The critical load will no longer be fed from the UPS.

**In the occurrence of AC mains failure, power to the load will also fail.**

## RESTARTING NORMAL OPERATION

To restart UPS operation, rotate the switch from "Bypass" position to "Restart" position. AC Mains is now being fed to UPS. Turn the UPS on with the front panel pushbutton as per UPS manual.

The UPS display should now read "Bypass Mode".

Once the UPS is in "Bypass Mode", it is safe to switch over to "Normal" position on the MBS. After a short delay, the UPS will switch over to "Online Mode" and critical load will then be protected against mains failure by the UPS.

# 6.0 INSTALLATION

Eaton MBS are supplied as soft-wired units housed in a sheet metal enclosure. The enclosures are intended for wall mounting.

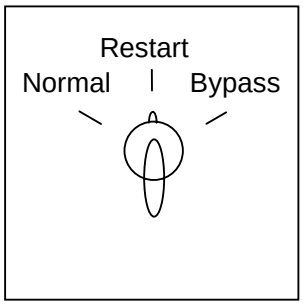


Figure 4: MBB Type MBS with Inverter Interlock

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Please read the following instructions carefully. Refer also to Figures 5 & 6 under Section 7: Installation for details on connection, and Figures 7 & 8 for UPS plug and socket-outlet locations.

1. Mount the MBS enclosure on a wall in a suitable location for safe and convenient operation. Keyholes have been provided for this purpose at the top and bottom of the switch.

2. Remove the linked plug from the “Inverter Shutdown” (“Force to Bypass” X5 for 9130) socket on the UPS rear panel and replace with the Inverter Interlock cable supplied. Route cable to the socket marked “Inverter Interlock” on the Maintenance Bypass Switch. Ensure that the plug connected to the UPS socket is fixed securely using the screws on the plug. 3kVA MBS units also require plug screws on the MBS socket to be secured.

3. Using the IEC Male / IEC Female cable supplied, connect plug on the UPS marked “INPUT” to the socket-outlet on the MBS marked “TO UPS INPUT”. (Cable is rated for 10A with 700VA – 2.2kVA UPS, and 15A for 3kVA UPS). Refer to Fig. 5 & 6 for further details.

4. Using the Australian Plug / IEC Female cable supplied, connect the UPS socket-outlet marked “LOAD SEGMENT 1” to the MBS plug marked “FROM UPS OUTPUT”. (Cable is rated for 10A with 700VA - 2kVA UPS, and 15A for 3kVA UPS). If no “LOAD SEGMENT” is identified on the UPS, use any Australian output socket. Refer to Fig. 5 & 6 for further details.

5. Connect the load cables to the load socket-outlets on the MBS. (700VA – 2.2kVA MBS units will accept 2 x 10A Australian Standard Mains plugs and 3kVA units will accept 2x 10A or 15A Plugs.) Refer to Fig. 5 & 6 for further details.

6. **ENSURE MAINS SUPPLY IS SWITCHED OFF FIRST.** Then connect AC Mains Supply to the socket of the MBS marked “MAINS INPUT” with the power cable supplied with UPS.

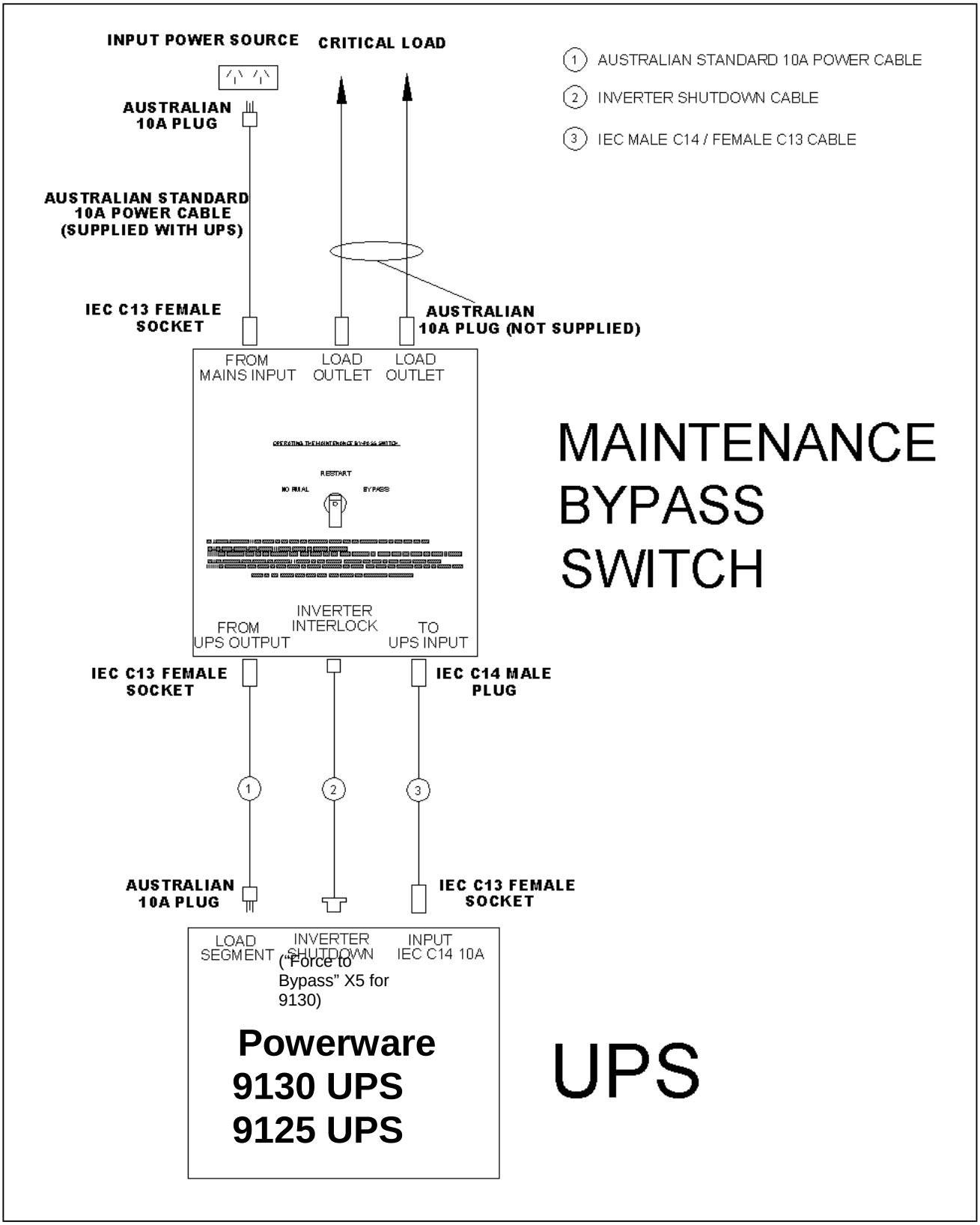


**Figure 5: Connection Diagram of MBS (700, 1000, 1500, 2000 and 2200VA)**

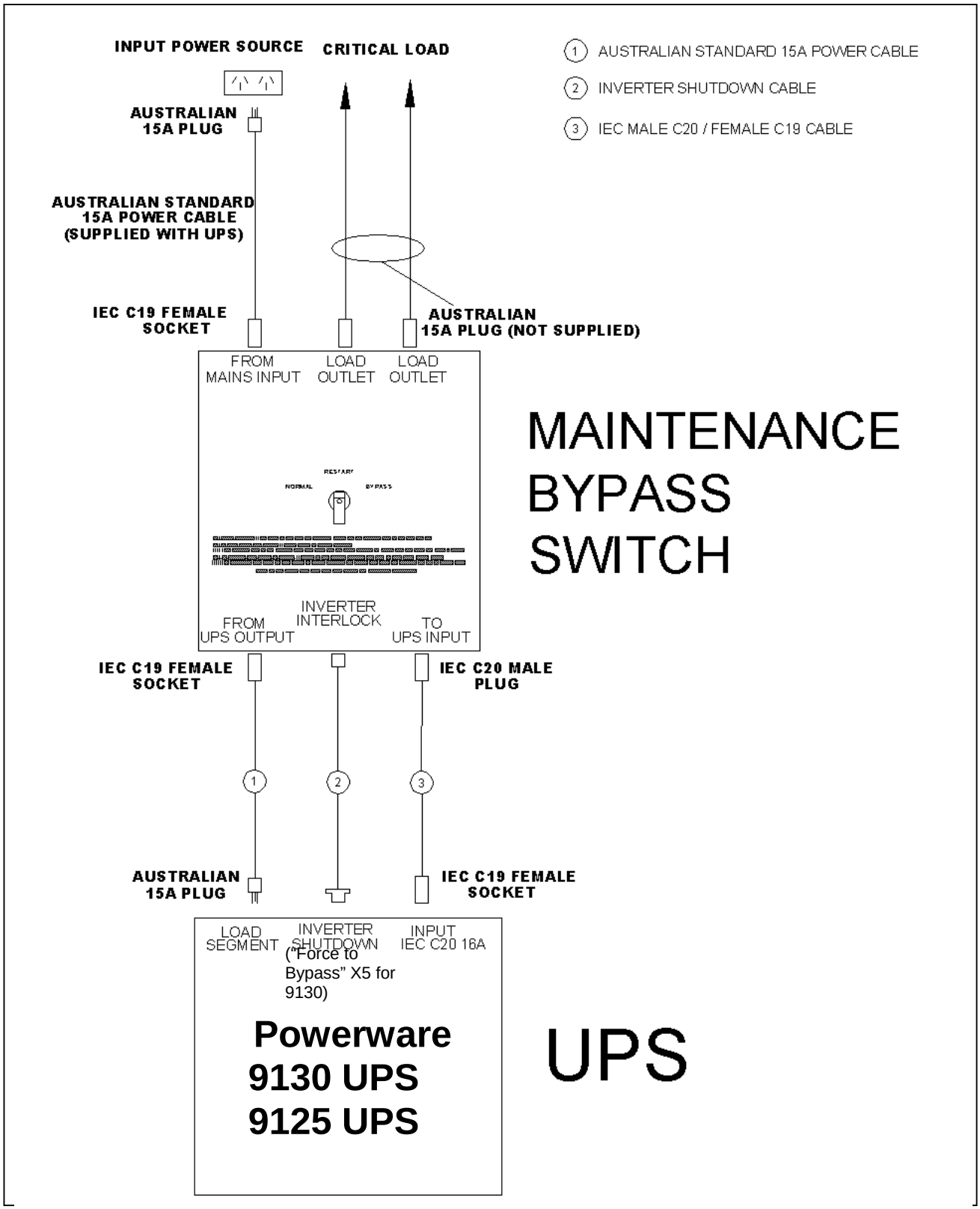


**Figure 6: Connection Diagram of 3kVA Maintenance Bypass Switch**

# 7.0 DRAWINGS

## 7.1 Rear Panel and Location of "Force to Bypass" Connection. (9130 - 700VA)

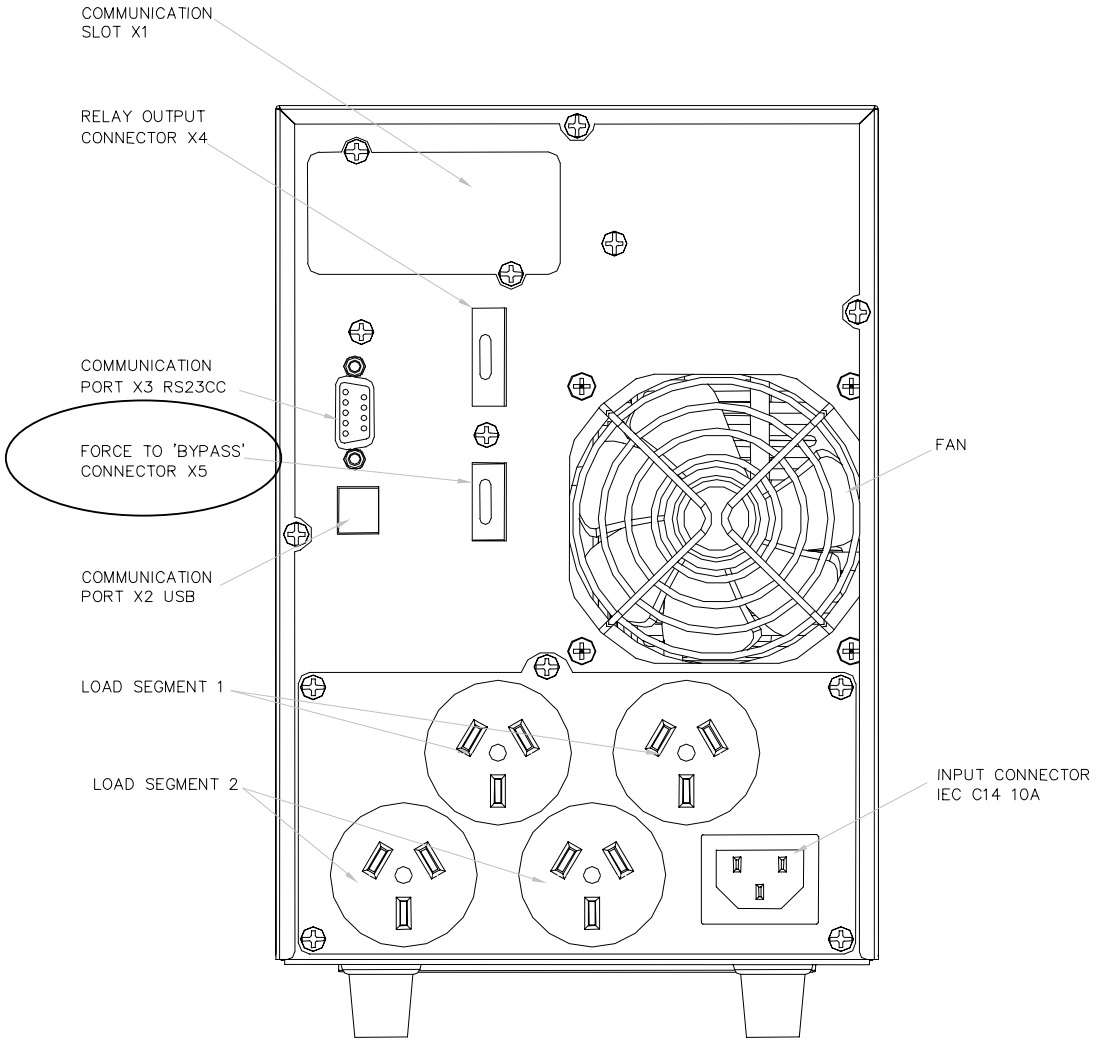


**Figure 7: Rear Panel of Eaton 9130 700VA**

## 7.2 Rear Panel and Location of "Force to Bypass" Connection. (9130 -1kVA)

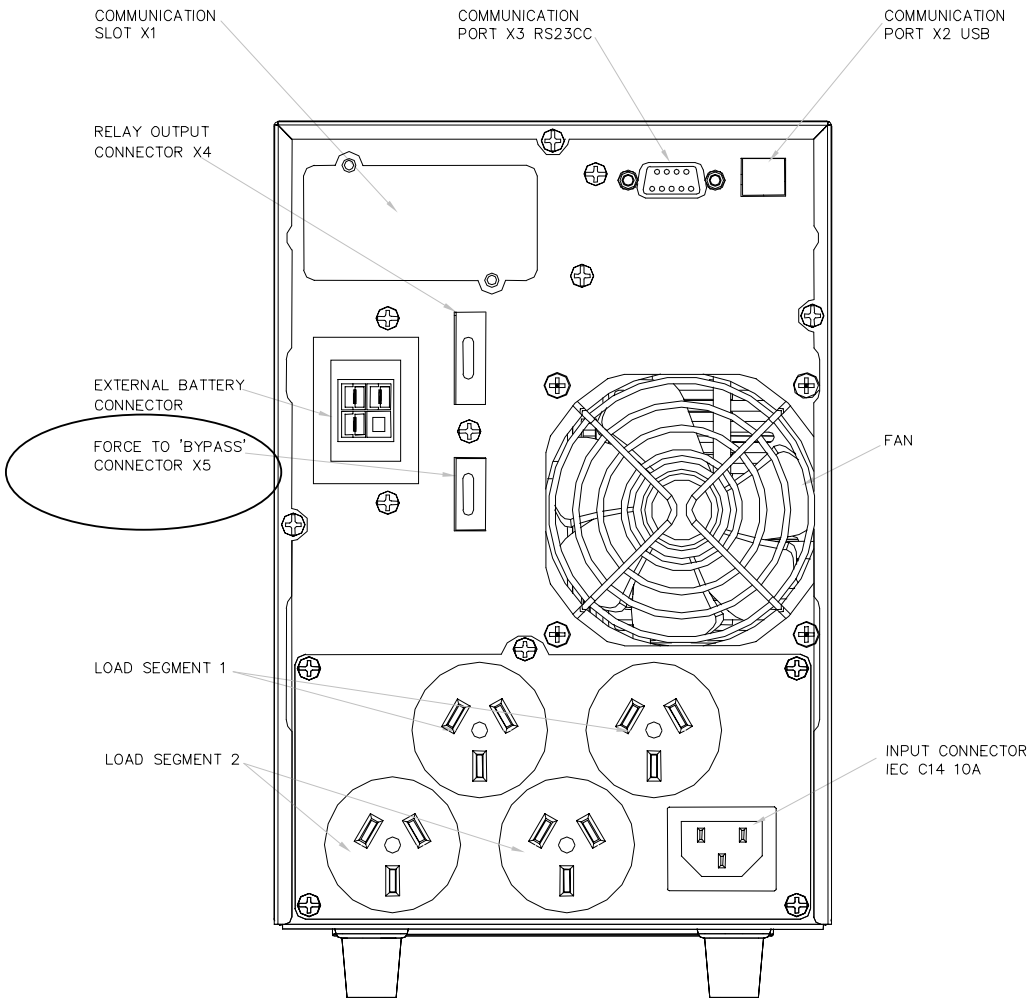


**Figure 8 Rear Panel of Eaton 9130 1kVA**

## 7.3 Rear Panel and Location of "Force to Bypass" Connection. (9130 - 1.5kVA)

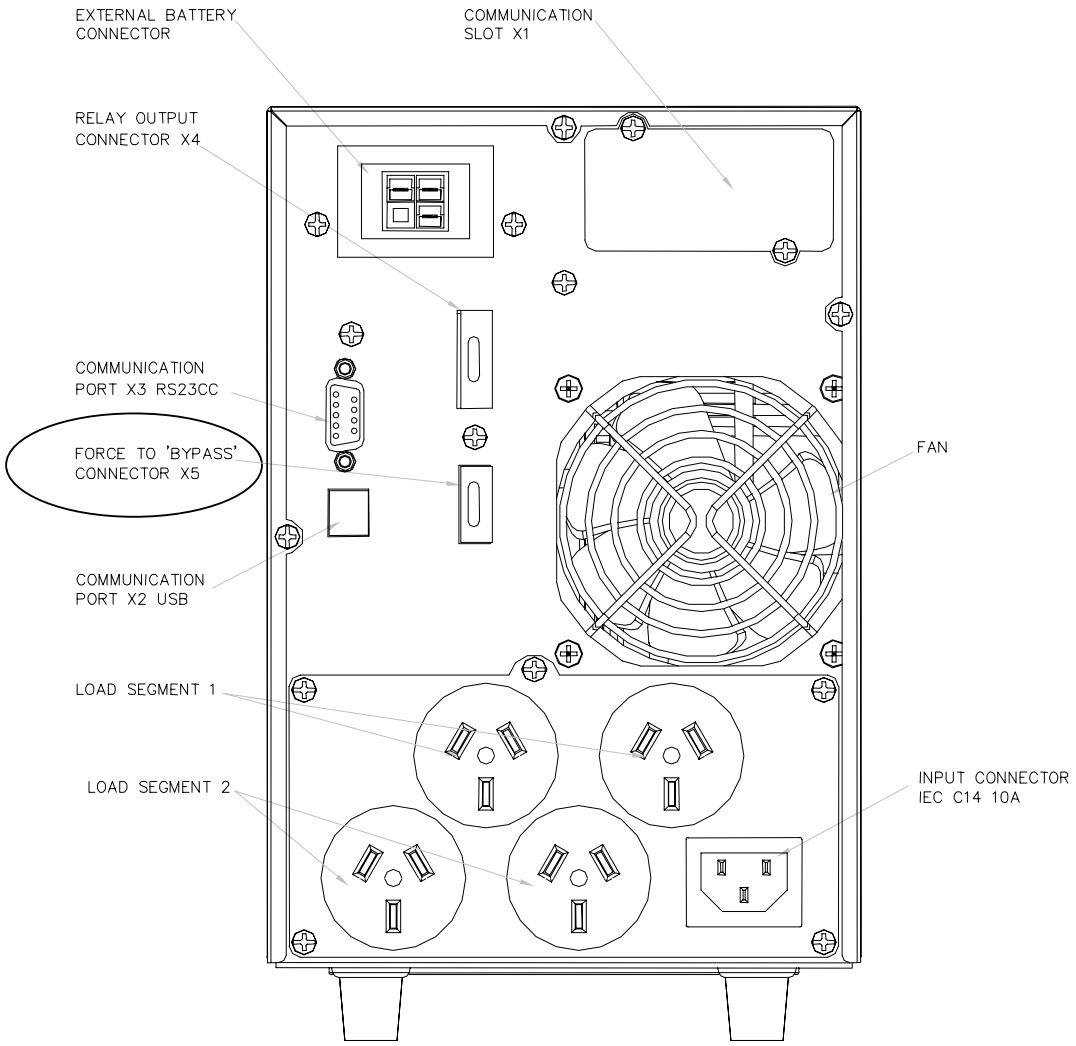


**Figure 9: Rear Panel of Eaton 9130 1.5kVA**

## 7.4 Rear Panel and Location of “Force to Bypass” Connection. (9130 - 2kVA)

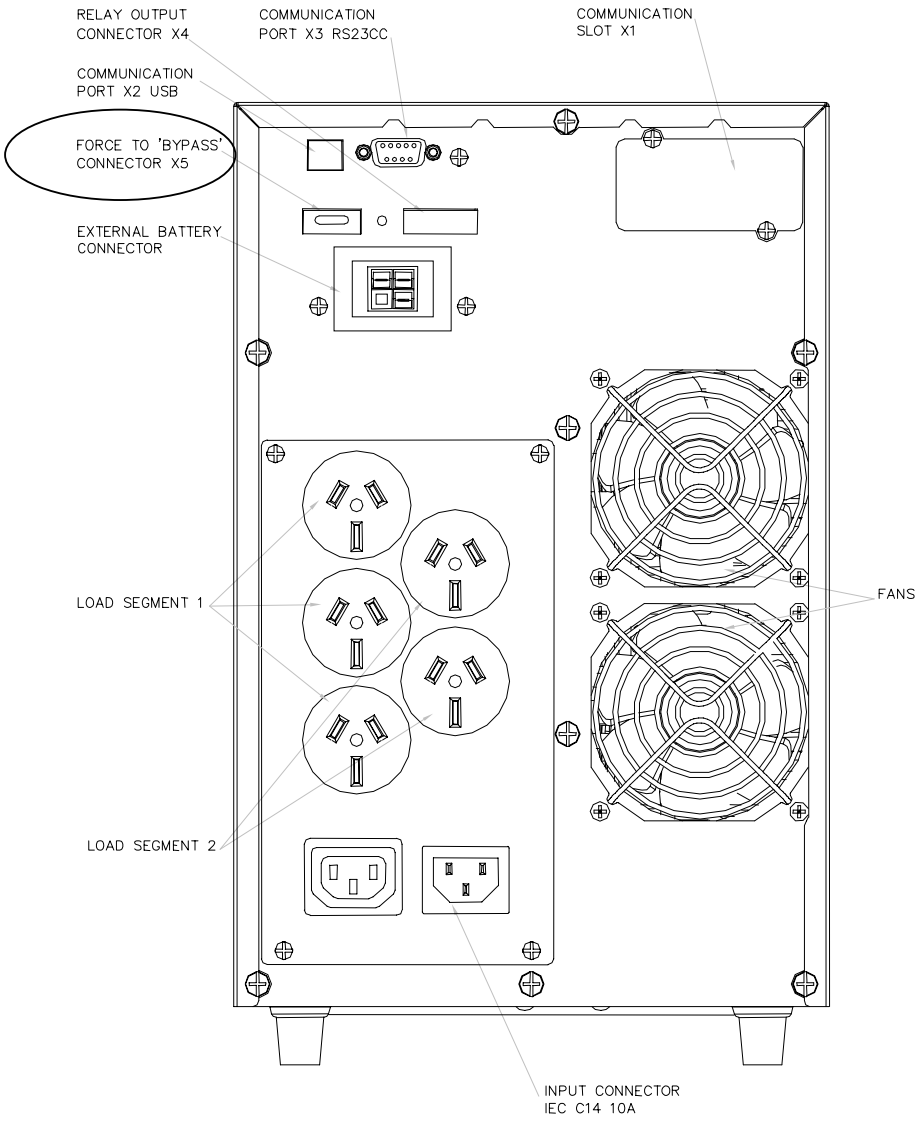


**Figure 10: Rear Panel of Eaton 9130 2kVA**

## 7.5 Rear Panel and Location of “Force to Bypass” Connection.(9130 - 3kVA)

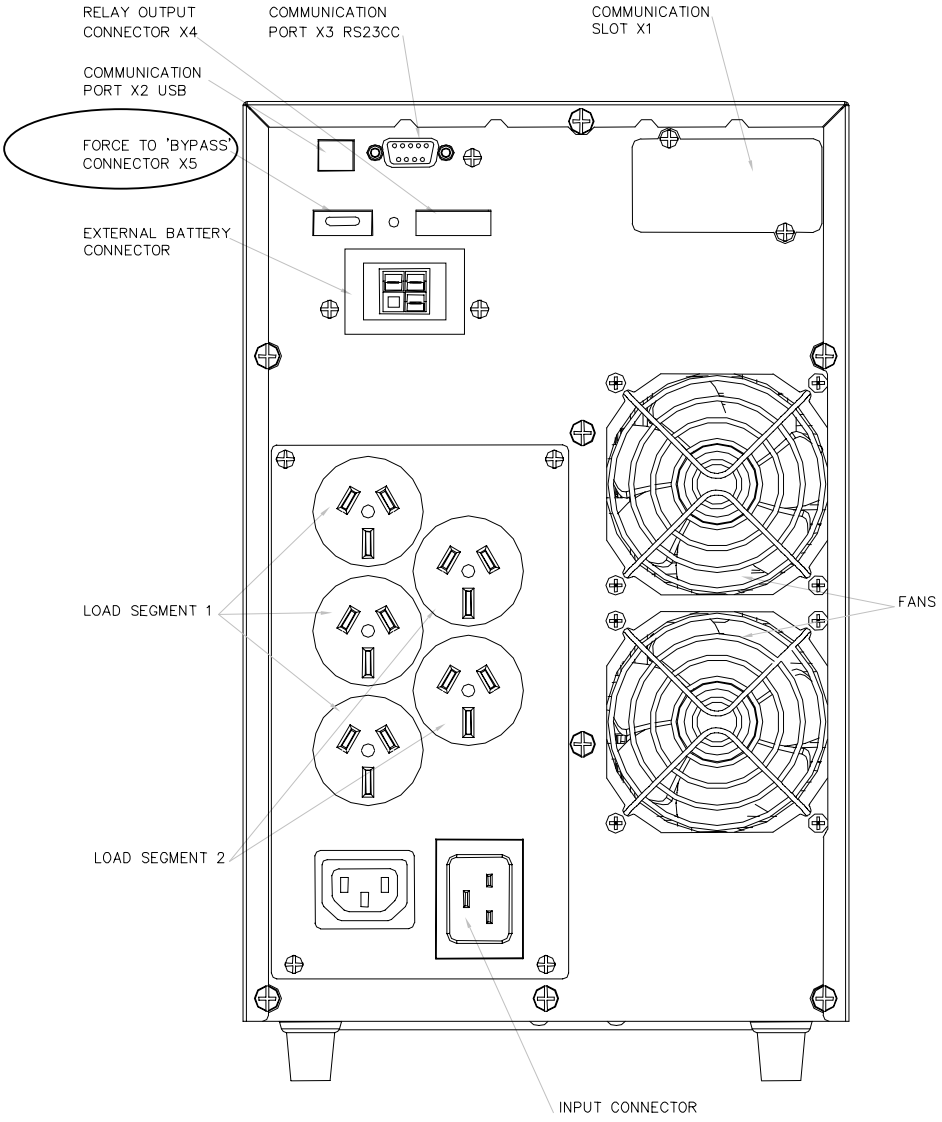


**Figure 11: Rear Panel of Eaton 9130 3kVA**

## 7.6 Rear Panel and Location of Inverter Shutdown Connection (9125-2.2kVA)

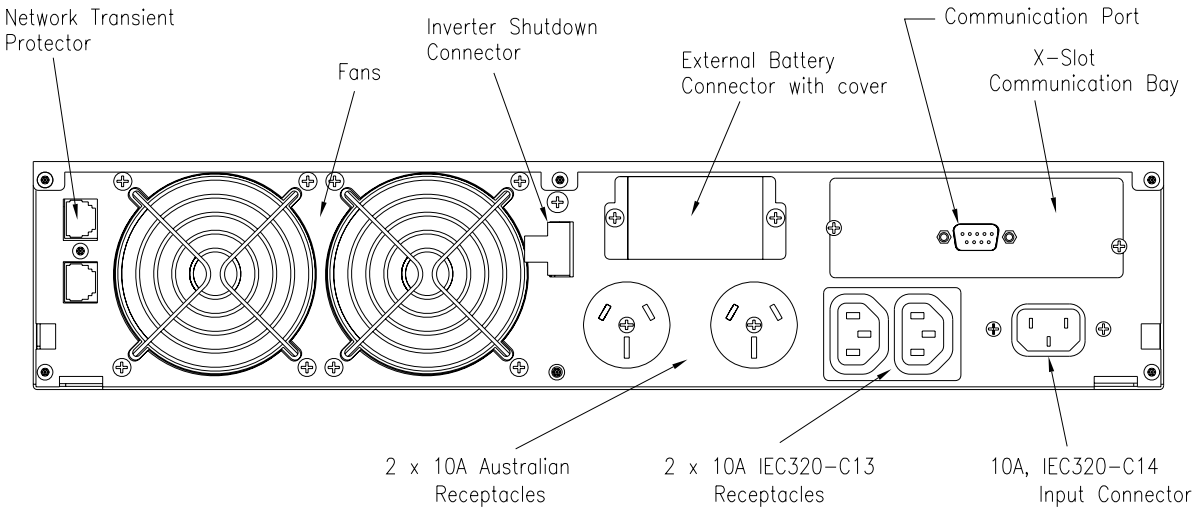


**Figure 12: Rear Panel of Eaton 9125 2.2kVA**

## 7.7 Rear Panel and Location of Inverter Shutdown Connection (9125 – 3kVA)

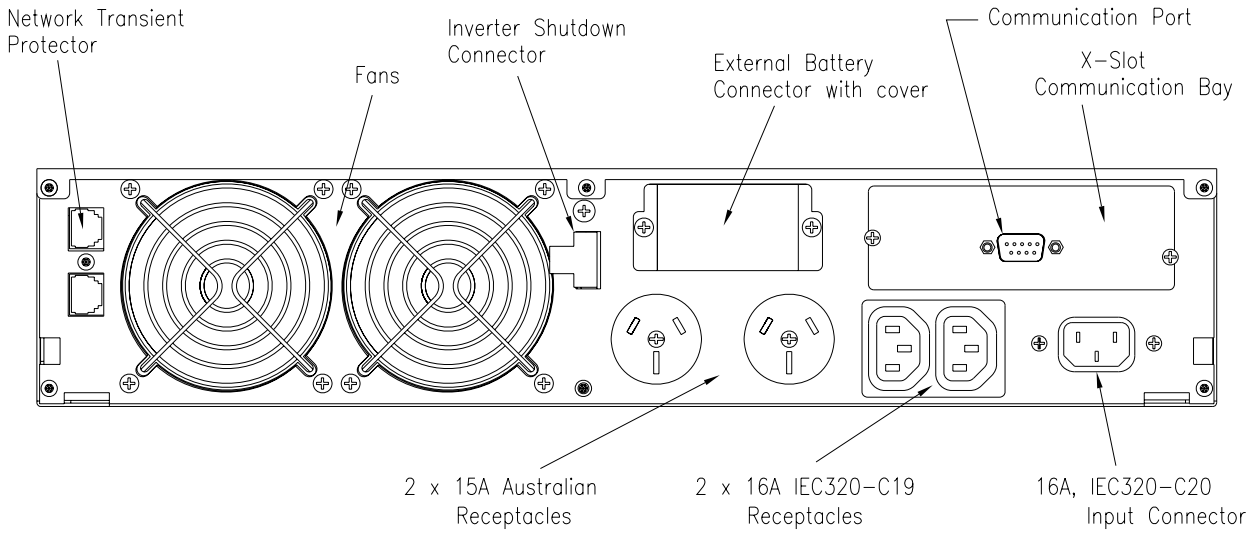


**Figure 13 Rear Panel of Eaton 9125 3kVA**

# 8.0 REPAIR OR RETURN FOR SERVICE

If Maintenance Bypass Switch performance is unsatisfactory and outside of specification, contact the Service Centre (details listed on the back page of this Manual) and advise all the results of tests and observations. Servicing arrangements can then be made. If a Maintenance Bypass Switch is to be returned to Eaton for any reason, please obtain a Return Authorisation Number first, and after ensuring appropriate packaging, mark the “RA” number on it so that it is clearly visible. Packages without this “RA” number may not be accepted by our Inwards Goods Department.

## REPAIR

If poor performance is confirmed you should contact Eaton Industries Pty Ltd National Service operation. If the unit is to be returned to Eaton Industries Pty Ltd for any reason, please obtain a “Return Authorisation” (RA) number first, and mark it clearly on the packaging.

Delivery of packages not marked with an “RA” number may not be accepted by our Inwards Goods Department.

ABN 82 054 056 709

**Office:** 13 Healey Road, Dandenong, Victoria 3175
Phone:03-9706 5022 Fax: 03-9794 9150

## Eaton Industries Pty Ltd
## NATIONAL SERVICE
## Phone 1300 303 059

When ordering replacement parts, always specify:

1. Part Number.
2. Serial Number of the unit.
3. Part Number, Description and Quantity required.
4. Original Date of Purchase of the Maintenance Bypass Switch.
5. Any Special Shipping Instructions.

Parts, orders and all correspondence regarding repairs under the warranty should be addressed to Eaton Industries Pty Ltd Service Department, 13 Healey Rd Dandenong, Victoria 3175.