INSTALLATION GUIDE

Tower Maxi T UPS

Single phase input – single phase output

Single conversion on line UPS

Tower Electronic Systems
Design and Manufacture of AC and DC Power Products

17 Fennel Street, Village Deep, Johannesburg. PO Box 3274, Northcliff 2125
Tel: 011 4935889 011 493 5721 Fax: 011 4936479

INSTALLATION

GENERAL

The following information will be of assistance when installing your UPS. Care should be taken to select the correct circuit breakers and cable sizes. Information is provided in the table below that will assist with the selection.

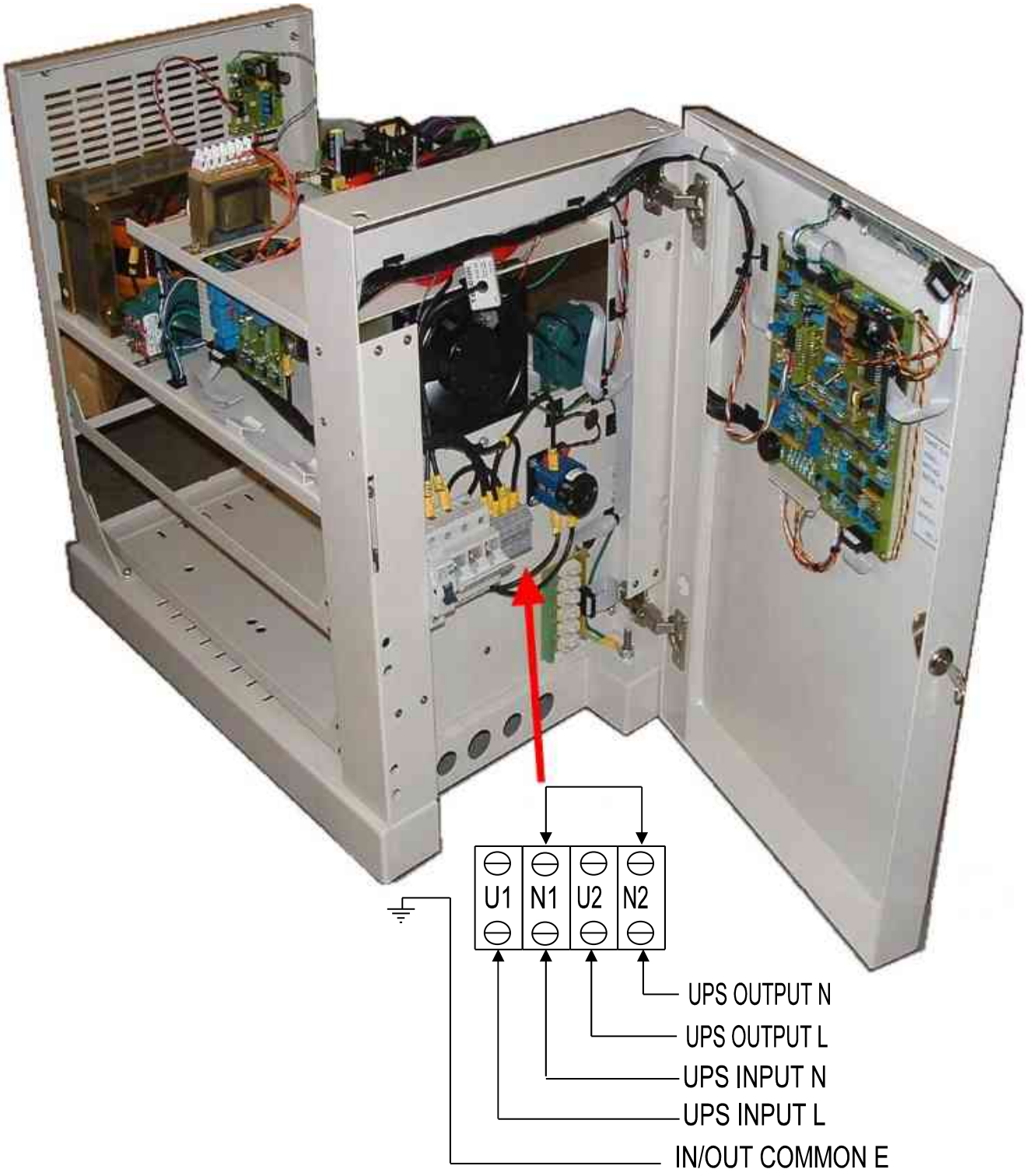
INPUT AND OUTPUT CABLING AND CIRCUIT BREAKER DATA

The recommended input circuit breaker (in clients' DB board) and cable sizes for the different UPS units are as follows:

NOTE:

- *The input circuit breaker must have a D curve rating.*
- *All cable sizes are rated for a maximum distance of up to 50 meters.*

UPS Rating (kVA)	Input Current	Recommended Circuit Breaker	Recommended Input Cable	Output Current	Recommended Output Cable
5	22A	30A 1 pole	6mm^2 2c+e	22A	4mm^2 2c+e
8	35A	40A 1 pole	10mm^2 2c+e	35A	6mm^2 2c+e
10	44A	50A 1plole	10mm^2 2c+e	44A	10mm^2 2c+e
15	67A	80A 1 pole	16mm^2 2c+e	65A	16mm^2 2c+e
20	87A	100A 1 pole	20mm^2 2c+e	87A	20mm^2 2c+e

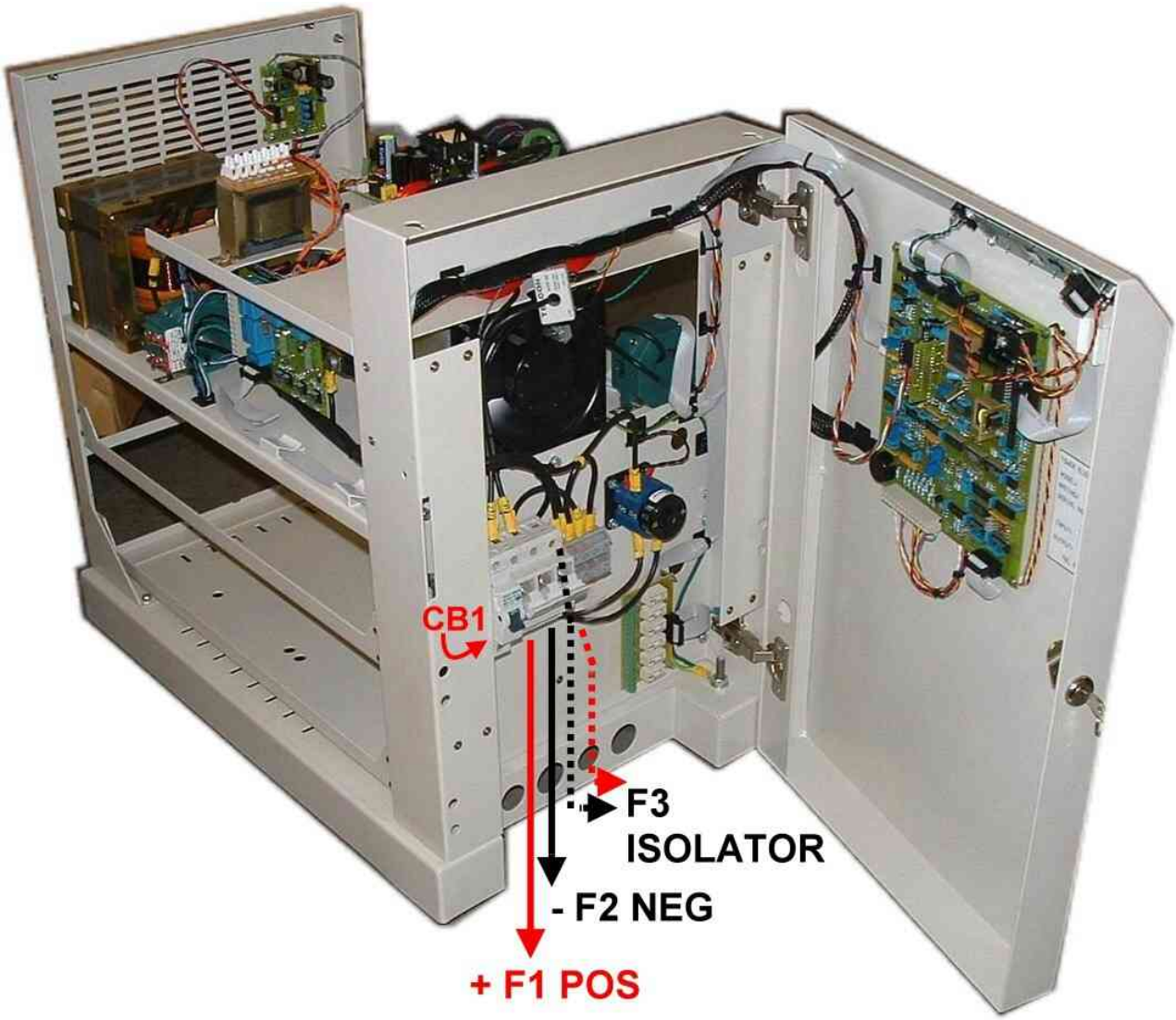


Installation wiring layout.

For 5kVA and 8kVA units, put the rotary bypass switch into the TEST position BEFORE supplying power to the input cables.

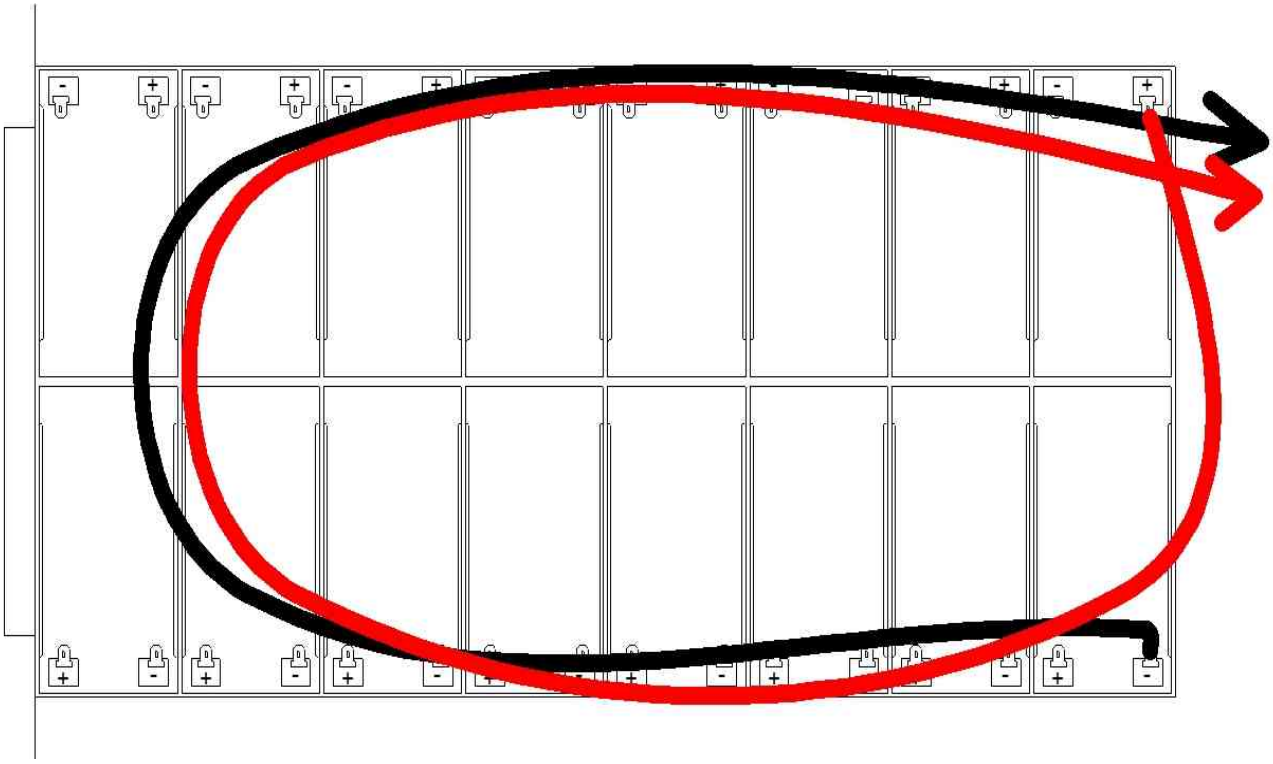
BATTERY CONNECTION

A battery tray can house 16 batteries. [32 batteries per bank.]



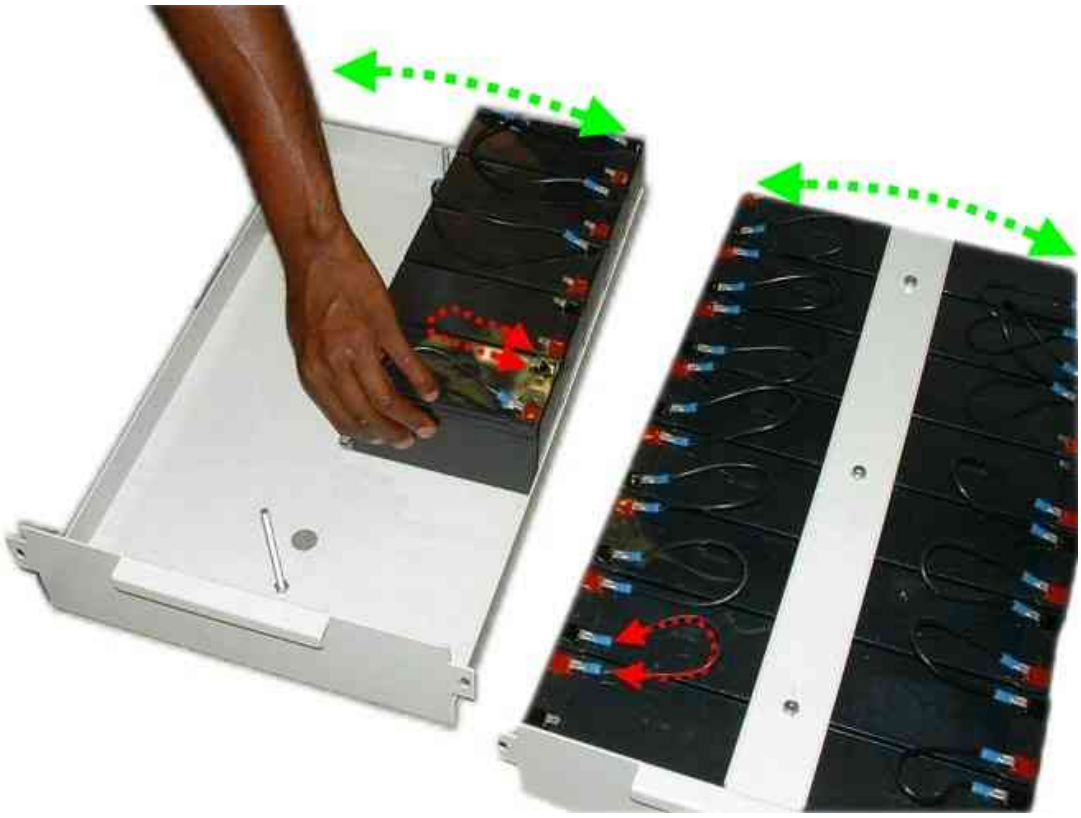
Open all three battery fuses.
Populate the battery trays, each with 16 x 12V x 7A/h batteries - terminals facing out.

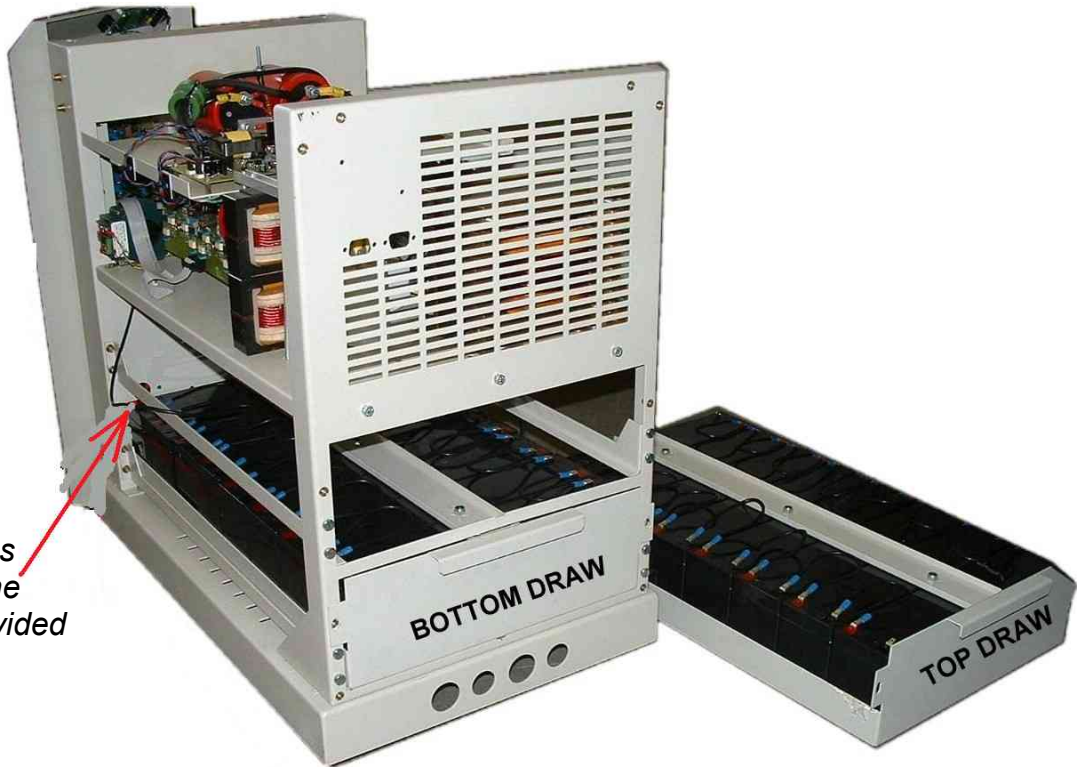
Connect the long red and black cables to the front positive and negative terminals and loop them together so that the pair of them exits near the positive terminal as shown below.



Connect the short interconnecting cables (indicated in **red**) to all the batteries on the LHS and RHS.

Leave the 2 links at the back of the tray open (indicated in green), theses battery links will later be connected using the longer links.

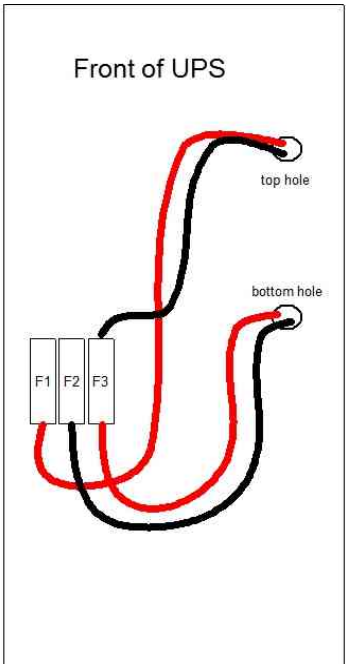




Insert all the trays into the UPS, starting at the bottom - **taking care not to pinch any of the cables** that must go through their respective holes (in the front).
Simply guide the ends of the cables cables through the holes, leaving all the excess slack on top of the batteries. **LEAVE THE LONGER BACK LINKS OUT**

From the front of the UPS, only the tips of the battery cables will be visable through the holes.
It is convinient to only pull through the length of cable needed to connect to the fuses.
For more than one reason, it is advisable to leave the rest of the slack on top of the batteries.

Connect the top red to F1
Connect Bottom black to F2
Connect remaining wires to F3



It is important to note that these battery wires are completely safe to work with because the longer back connecting links are breaking the circuit.

Should the unit have more than one battery bank then the same pattern should be adhered to for the other bank.

The parallel connections will happen on the fuses,
ie. there will be two reds at the bottom of F1
(one from the top shelf and one from the 3rd shelf)
there will be two blacks at the bottom of F2
(one from the 2nd shelf and one from the bottom shelf)
etc..

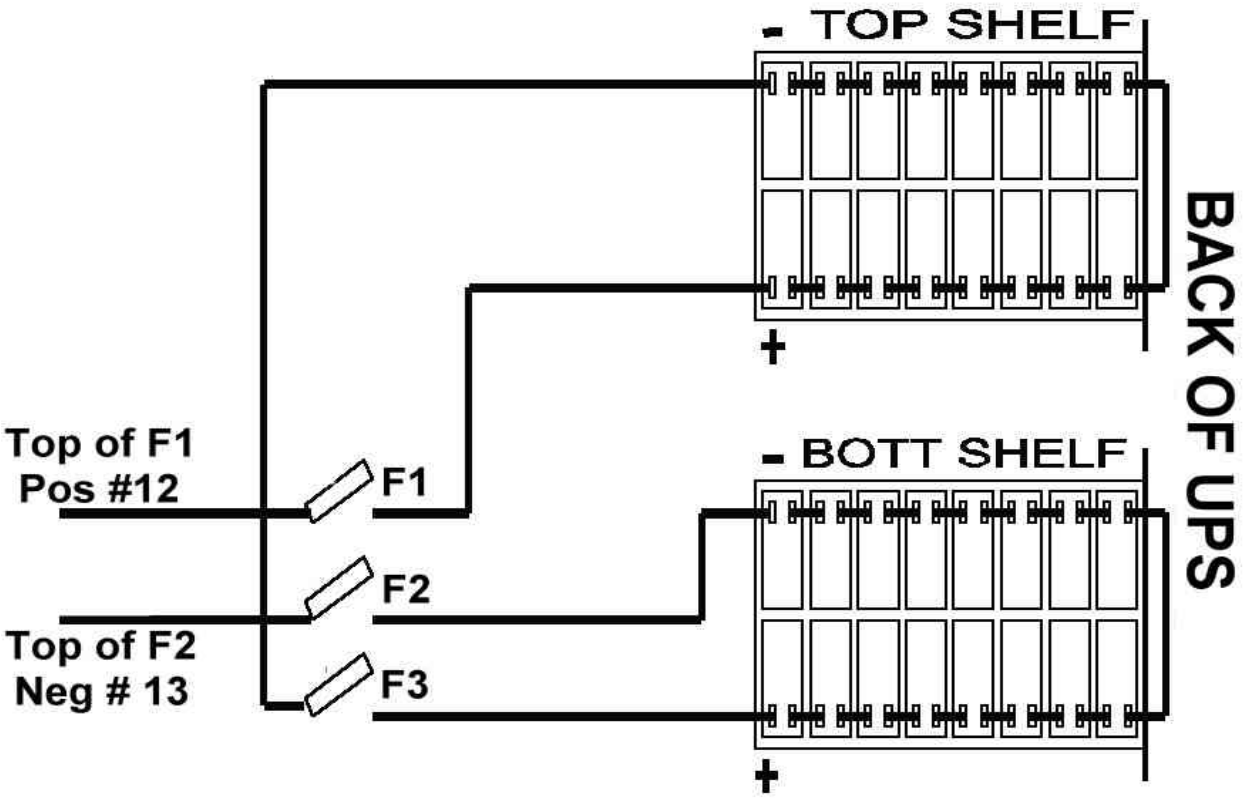
LAST BATTERY LINK (Green)

Once all the wires are secure in the fuse holders, and you are ready to carry on, slightly open each battery tray and measure the differential between the last two battery terminals (ie the two that do not have any wires connected to them)

If this differential voltage is less than 3VDC, it is safe to insert the medium end connector cables across those links that were just measured (Green).

Take care when re-closing the trays that these medium connecting cables are tucked under the above tray to avoid them being pinched.

Battery Wiring Diagram



SYSTEM OPERATING PROCEDURES

INITIAL STARTUP OF UPS UNIT

- Turn the *INVERTER KEY SWITCH* to the off position.
    - For 5kVA and 8kVA units
        - Place the *ROTARY BYPASS* switch into the *TEST* position.
    - For 10 - 20kVA units
        - Close the *BYPASS ISOLATOR (SW2).*
        - Open the *OUTPUT ISOLATOR (SW1).*
- Close the AC input circuit breaker *(CB1).*
- The LCD will activate.
- After a period of approximately 30 seconds the analog values and status alarms will be displayed.
- The unit will synchronise to mains.
- Depress *ALARM CANCEL* button to silence alarm.
- Turn the *INVERTER KEY SWITCH* to the *"ON"* position.
- The unit will start up within 10 – 20 seconds.
- The UPS output voltage will ramp up to 230VAC.
- Ensure that **NO ACTIVE ALARMS** is displayed in the alarm status block and that the battery voltage is greater than 360VDC (432VDC is the charging value).
- Measure the DC differential voltage across (from top to bottom of...) F1 (with the multimeter set to DC).
  Close **ONLY THIS FUSE** if the differential voltage is less than 30VDC.
- Repeat for F2 and F3.
- Turn the *INVERTER KEY SWITCH* to the *"OFF"* position and confirm *LOAD ON BYPASS* is displayed on the *LCD DISPLAY.*
    - For 5 - 8kVA units
        - Place the *ROTARY BYPASS* switch into the *NORMAL* position.
    - For 10 - 20kVA units
        - Close the *OUTPUT ISOLATOR (SW1).*
        - Open the *BYPASS ISOLATOR (SW2).*
- Turn the *INVERTER KEY SWITCH* to the "ON" position (CW) and depress *ALARM CANCEL* button to silence alarm.
- Confirm **NO ACTIVE ALARMS** is displayed on the *LCD DISPLAY* within 60 sec.
- The unit is operating normally.

SHUTING THE UNIT DOWN – (without loosing power to the load)

- To transfer to bypass without loosing the load, ensure that *NO ACTIVE ALARMS* is displayed.
- Turn the INVERTER KEY SWITCH to the off position.
  The load is now supplied by mains via the static switch.
  Confirm LOAD ON BYPASS is displayed.

  - For 5 - 8kVA units
    - Place the *ROTARY BYPASS* switch into the *TEST* position.
  - For 10 - 20kVA units
    - Close the *BYPASS ISOLATOR (SW2).*
    - Open the *OUTPUT ISOLATOR (SW1).*

- The load is now supplied by mains via the detour (bypass) switch.
- Open DC Input fuses (F1,F2 andF3).
- Open AC input circuit breaker (CB1).
- Wait 1 min for the internal capacitors to discharge (Electronics will die when discharged.)

- To switch the unit on again, refer to *INITIAL STARTUP.*