XTRALIS POWER SUPPLY UNITS STYLE E5 QUICK REFERENCE GUIDE

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Doc. No. 38278_00

Preface

This Quick Reference Guide is intended to provide simplified application information to assist field engineers and technicians deal with issues that may be encountered in applications using the VPS Style E5 series of Power Supply Units (PSU).

For more details, please refer to the Application Note (Doc. No. 38276).

Related Products

Xtralis PSUs:

- VPS-215-E5
- VPS-220-E5
- VPS-250-E5
- VPS-220-STX5
- VPS-250-STX5

Safety

Warning!

- Mains voltages are present and safe working practices must be observed.
- Any maintenance or activity outside the normal operating conditions must only be carried out by competent personnel.
- Even when the incoming mains has been disconnected, hazardous voltages may still be present. The red LED (for avoidance of doubt there is only one red LED on the PSUs) indicates that hazardous voltage may be present. In normal operation the hazard is inaccessible, being on the underside of the PCB or under the plastic cover.

Warning!

- Batteries can source extremely high current which will heat any conductor such that it will cause severe thermal damage and even combustion.
- Take great care to avoid a direct short circuit between any +V and 0V terminal, on the batteries or on the PCB.
- Do not wear any metal objects on or near your hands, such as rings, bracelets and watches.
- You must cover unused battery terminals to prevent accidental short circuits.

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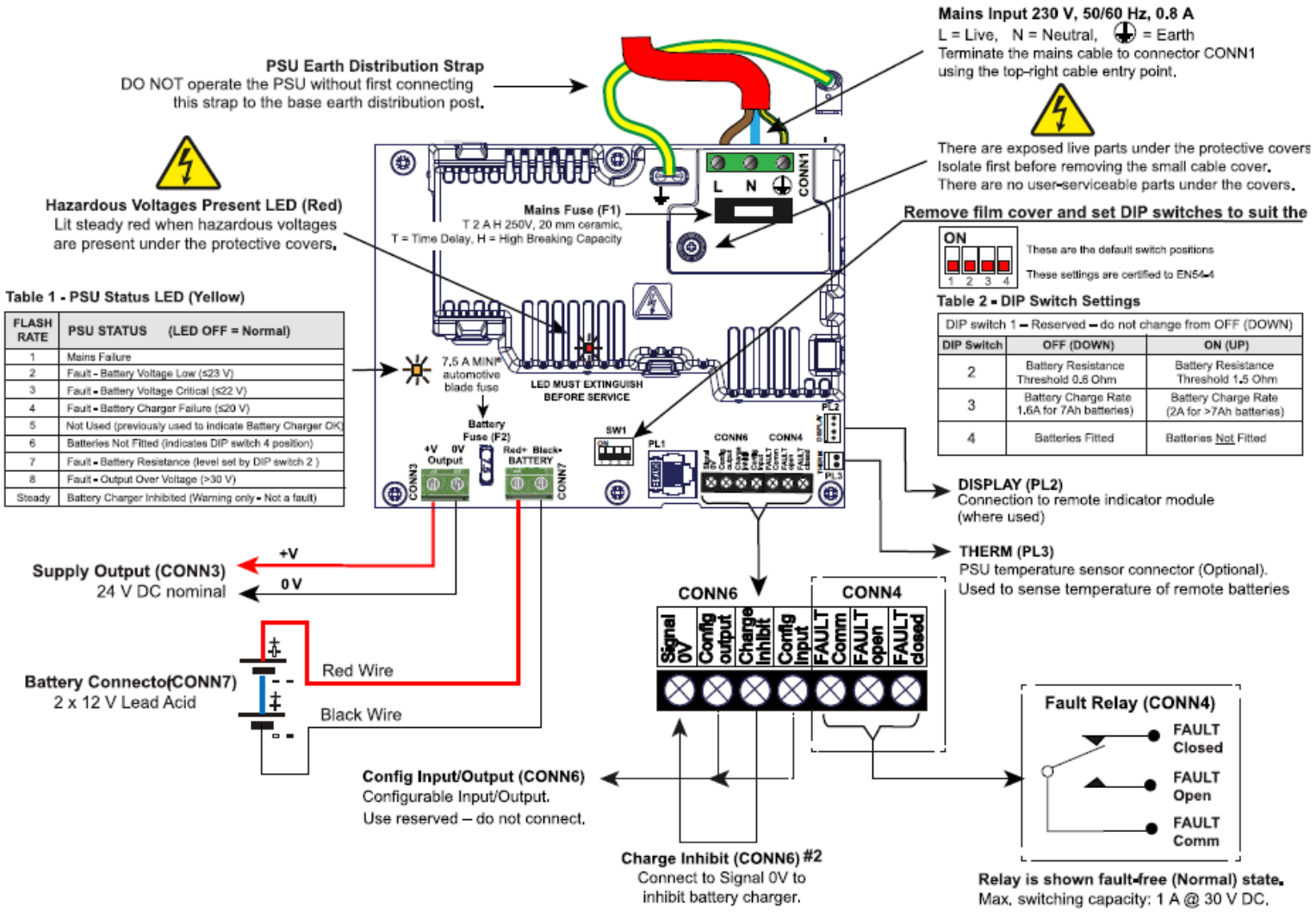
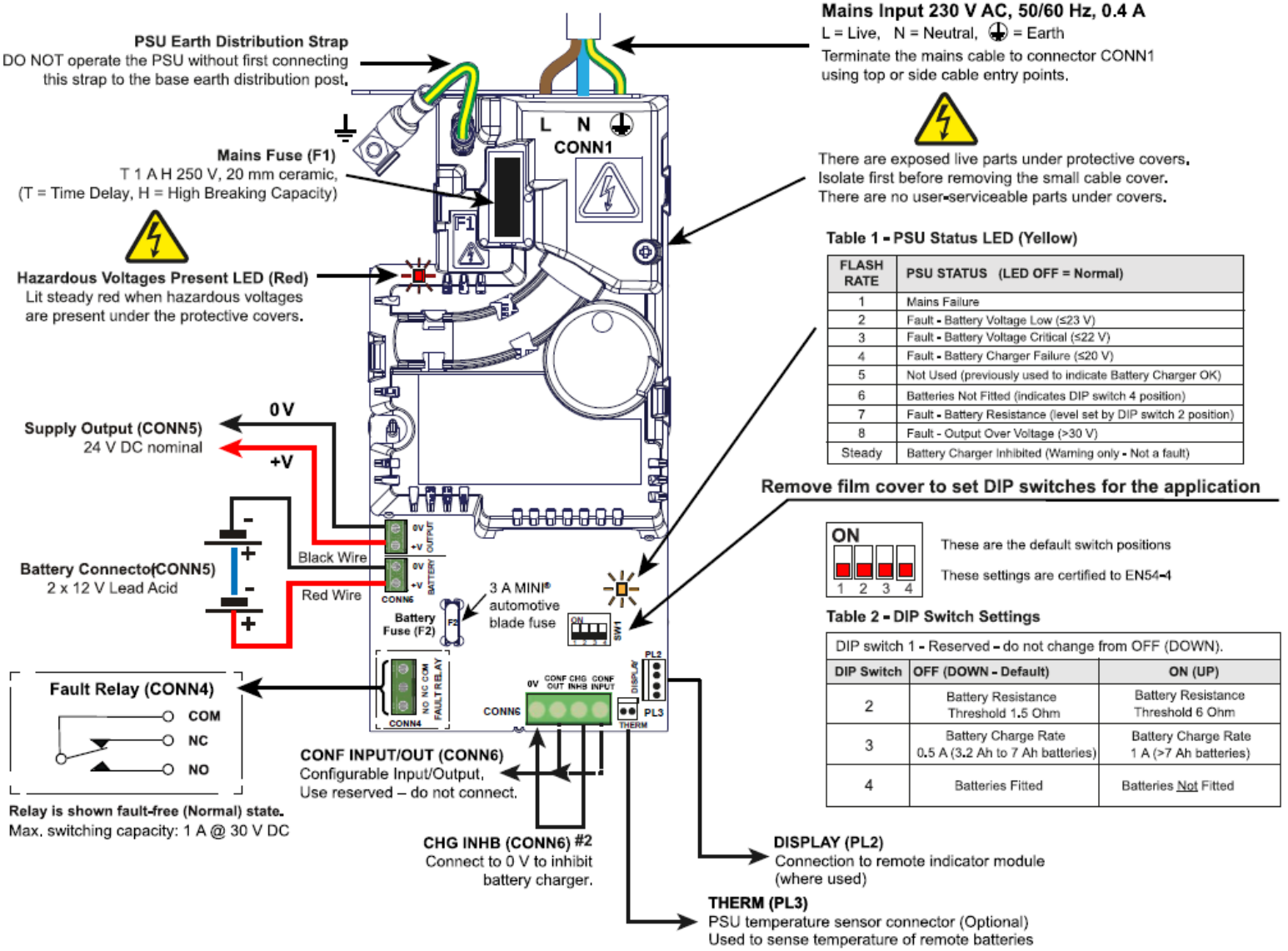
1 Quick Reference Charts

1.1 VPS-250-XX



1.2 VPS-215-XX and VPS-220-XX



FLASH RATE	PSU STATUS (LED OFF = Normal)
1	Mains Failure
2	Fault - Battery Voltage Low (≤23 V)
3	Fault - Battery Voltage Critical (≤22 V)
4	Fault - Battery Charger Failure (≤20 V)
5	Not Used (previously used to indicate Battery Charger OK)
6	Batteries Not Fitted (indicates DIP switch 4 position)
7	Fault - Battery Resistance (level set by DIP switch 2 position)
8	Fault - Output Over Voltage (>30 V)
Steady	Battery Charger Inhibited (Warning only - Not a fault)

DIP switch 1 - Reserved – do not change from OFF (DOWN).		
DIP Switch	**OFF (DOWN - Default)**	**ON (UP)**
2	Battery Resistance Threshold 1.5 Ohm	Battery Resistance Threshold 6 Ohm
3	Battery Charge Rate 0.5 A (3.2 Ah to 7 Ah batteries)	Battery Charge Rate 1 A (>7 Ah batteries)
4	Batteries Fitted	Batteries Not Fitted

2 Periodic Maintenance Measurements

The PSU is designed to be maintenance free, but batteries do have a finite lifetime. The PSU provides an indication of the health of the battery.

It is acknowledged that some applications require manual measurements to be made to confirm the correct operation of the PSU and the health of the battery.

These measurements usually consist of a measurement of the battery voltage in normal operation, a further measurement of the battery with the mains disconnected and a check that the PSU will support the application load with the battery disconnected

However, VPS-215-XX and VPS-220-XX have some special requirements for the periodic maintenance checks. In this case it is essential that the test is carried out in this order:

1. Disconnect battery
2. Perform load test
3. Reconnect battery
4. Measure battery voltage
5. Disconnect mains
6. Measure battery voltage
7. Reconnect mains

The minimum period between stage 5 and stage 7 must be 10 seconds.

This is because the overload protection in the SMPS controller Integrated Circuit (IC) detects a momentary overload when the battery is reconnected. This protection is latching and requires the mains to be disconnected to reset the IC. By conducting the test procedure in the order above, the required reset is built into the test. This protection is hard coded into the IC and cannot be turned off.

Note!

This does not apply to the VPS-250-XX PSU which uses a different SMPS controller IC.

3 1st Line Troubleshooting

- In the event of a fault occurring, the fault relay will change state. In order to identify the fault that has occurred, it is necessary to attend the PSU while the fault condition exists so that the fault condition can be identified by observing the code indicated by the flashing yellow LED.
- Note that faults are not latching. If the fault condition clears before the LED is observed, it may not be possible to identify the fault. Fault conditions are not logged.
- If the red LED is not illuminated, check the primary fuse and the incoming mains supply. If necessary, replace the fuse with the same type and rating. If the fuse operates again, the PSU is probably defective and must be changed.
- If the yellow LED is flashing, count the number of blinks. Compare this with the table in the quick reference charts above.
- If the battery voltage is low, it is likely that the battery is depleted. Has there been a failure of the mains? The fault will clear if the battery voltage increases to greater than 23V. If the battery voltage does not increase, it is likely that the battery is defective and must be replaced.
- Note that if the battery voltage drops below 20V, the charger is disabled to prevent a possible hazard condition created by charging a damaged battery.
- If the battery charge voltage is not present, or the battery does not power the application, check the battery fuse. If this fuse has operated, replace it with the same type and rating of fuse. If the fuse operates again, do not replace it again. Return the PSU for investigation. The probable reason for this fuse to operate is a short circuit on the PSU output or a reversal of the battery leads. Because the battery can supply very large currents within a short time, damage to the PSU circuitry may occur before the fuse can operate.
- If a battery has been disconnected for any reason in a VPS-215-XX or VPS-220-XX PSU, the output may shut down after a few minutes, but the red LED may continue to be illuminated. This is the condition outlined in section 2 Periodic Maintenance Measurements. This can be rectified by disconnecting the mains supply for at least 10 seconds. This fault can be prevented by disconnecting the mains supply every time a battery is reconnected. This does not apply to VPS-250-XX PSUs.
- In a relatively small number of cases, there have been reports of a battery internal resistance fault occurring intermittently and clearing within a short time. The PSU continues to function correctly, but such a fault is a nuisance because it needs to be investigated, particularly if the fault is latching in the application, which must be attended to clear the fault. If this is suspected, return the PSU for investigation.
- If a PSU is removed from the application because of a suspected fault, it should be marked with the date of and the reason for removal. Give as much information as possible to assist with the analysis of the problem.

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