

IT equipment

Information technology (IT) equipment covers all components of a computer system whether the system is a large networked system with multiple computers or a humble single machine system. Generally either of these systems will have the basic tower / desktop computer with a monitor and optional scanner / printer. The large systems will also include items like hubs, switches, routers and USB / NAS external hard drives. Uninterrupted Power Supplies (UPS) and servers will also be present.

All of the above require a power supply either in the form of direct 230 V mains leads or a low voltage supplies via dedicated power supply (PSU) modules.

Earthed or unearthed equipment

Monitors and computers, whether a desktop, tower or server, are Class 1 earthed appliances and will be supplied by an earthed IEC 3 core 230 V power lead. There are a few exceptions such as a few budget TFT (flat screen) monitors which are powered from low voltage PSUs which can be Class 1 or Class 2 double insulated products.

It should be noted at this point that all Class 2 products should have the Class 2 double insulated symbol marked on the product.

Generally laser printers will be Class 1 earthed products with an IEC lead whereas inkjet printers are either Class 2, with a 2 core (figure of eight) 230 V lead or low voltage supplied by a Class 2 PSU.

Unfortunately, 99% of hubs, switches and routers are low voltage powered by a myriad of different voltage DC PSUs which may be either Class 1 or Class 2 products so caution has to be exercised when identifying these products.

Functional earthed equipment (ITE)

Some IT products have a PSU that appears to be an earthed Class 1 device with an IEC 3 pin socket, but when PAT tested as such, the device fails the bond / continuity test when the PAT tester's bond lead is attached to the only exposed metalwork visible; the sleeve of the low voltage DC plug that plugs into the IT equipment. Generally the test indicates the earth measurement is in excess of several ohms.

These products are technically called ITE (Information Technology Equipment) PSUs and have this printed on the underside of the product. Unfortunately the letters ITE are printed within a vast amount of technical information so are not easy to spot.

These devices internally have an insulated PSU that provides a low output DC voltage. The negative of the DC output is connected to the mains via a typically 10 or 100 ohm resistor. The purpose of this 'earth' is not to provide a circuit protective path to earth but to send high

voltage static charges that may build up within the PSU's connected low voltage equipment. Typical products are laptop computers and external hard drives which with continued use would build up a considerable static charge.

Regarding PAT testing these particular PSUs only a visual test can be made though the detachable 3 core mains supply lead should be tested separately as a standard IEC lead.



ITE Laptop Power Supply

PAT tests

The PAT testing of IT equipment is conducted much the same as standard appliances but care must be taken not to use excessive bond test current or use a 500 V insulation test. IT equipment generally uses the thin internal printed circuit board to provide interconnecting earth points so a bond current of 10 amps or more would burn out these tracks.

In addition IT equipment mains supply inputs have suppression components that would be destroyed with an insulation test in excess of 250 V.

Generally a continuity test current of 100 or 200 mA is considered the maximum and an insulation test 100 or 250 V is recommended.

Since the continuity test is such a low current a good connection of the PAT tester's earth continuity lead should be sought. For example, TFT monitors generally have an earthed panel on the rear where the VGA / DVI socket is fitted.

Some computer cases can also prove troublesome, giving high continuity readings when tested.

As such nearly all desktop and tower cases are now made in the Far East and due to size are exported by ship. As aluminium reacts with salt air a spray-on dressing is applied to the case during manufacture. In addition IT professionals tend not to fully tightened screws so with these facts in mind it is essential to ensure a good contact with the continuity lead.

Regarding the testing of the older CRT (Cathode Ray Tube) monitors under no circumstances should PAT testing personnel insert a continuity probe through the cooling vents on these pieces of equipment to achieve an 'earth connection'. These monitors have high operating voltages ranging from 400 to 25,000 V internally that can remain charged for several minutes after shut down.

Most PAT testers have an operation / load test function that runs the appliance for several seconds. This function for the PAT testing of IT equipment with hard drives should be treated with caution as this can cause disc 'read / write errors as these devices have a certain spin up speed. It should be noted that PSUs not connected to their relevant equipment will not show their correct load current.

On a final note once a group of IT devices have been tested it is important that the original PSU is mated up to its respect appliance due to the differing voltages and currents. An appliance connected to the wrong PSU can prove costly to replace and may prove to be a fire hazard.

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