



Application note no 25

EPAT1600/EPAT2100

Pat Testers

Guide to Pat Testing using the Martindale
EPAT1600/2100 series PAT Testers

- Connect the PAT tester to a source of power and ensure the wander lead is plugged in.

1. Visual Inspection

Examine the condition of the appliance to be tested as per best practice recommendations.

2. Earth Bond test – this is required for Class 1 (earthed) appliances only.

Select the test current according to the appliance plug/fuse rating eg.

- A lamp fitting with a 3/5 amp fuse would use the 8 amp setting.
- A kettle with a 13 amp fuse would use the 25 amp setting.
- IT equipment should be tested using the 100mA range.

Plug the appliance into the PAT tester, attach the wander lead to any exposed conductive surface or metalwork and switch on the appliance.

Press and hold the **CONTINUITY** button (for a maximum of 5 seconds)

The display should indicate a very low resistance value in ohms (such as 0.05 for example) confirming that a good solid earth return path exists from the earthpin on the appliance back to the tester via the wander lead. The **PASS** value required being **0.1 Ohms** or less. If the display reads “1” in the left-hand column then this is an indication that the reading is above the maximum resistance measurable by the

tester, i.e. the resistance is very high, and is thus a **FAIL**.

If the reading exceeds the pass value of **0.1 Ohms** by a **small amount** it is acceptable to take into account the internal resistance of the supply cable itself which can be deducted from the displayed value as per published guidelines (the IEE code of practice for portable appliance testing ref – IEEPATS3)

3. Insulation test

This test is carried out on both Class 1 (earthed) and Class 2 (double insulated) appliances.

The wander lead needs to be plugged into the tester at all times although electrically it is only required for class 2 devices. When testing Class 1 appliances therefore it is recommended that the exposed metal crocodile clip is parked safely inside the tester lid for the duration of the test.

Class 1 – Switch the appliance on & plug it into the tester. Press and hold the **INSULATION** button until a steady reading is obtained. Observe the reading displayed - the pass value required being **>1MΩ**.

Class 2 - Plug the appliance into the PAT tester, ensuring that it is switched on. Attach the wander lead to any exposed conductive surface. Press and hold the **INSULATION** button until a steady reading is obtained. Observe the reading, a pass value of **2MΩ or GREATER** is required.

The maximum reading on the EPAT1600/2100 for this test is 19.99 MΩ, any reading higher than this will be displayed as a “1” indicating an over-range value and therefore also a very good Pass.

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4. Run Current (Functional Test)/Fuse Test

On the EPAT2100 this test will power up the appliance to check functionality and also give an indication of the current being consumed. On the 1600 a "1" in the display indicates that the fuse is intact, a value of "0" indicates a blown fuse.

Press and hold the **RUN CURRENT** (2100) or **FUSE** (1600) button.

5. Run Leakage (EPAT 2100 only)

The wander lead is required.

Press and hold the **RUN LEAKAGE** button

Ideally this should register as 0mA - any higher reading gives an indication of current leakage to earth which can be useful for tracking down appliances that are causing nuisance tripping of RCDs. Pass limits vary from 0.25mA to 3.5mA depending on the type of appliance.

6. Flash Testing

Flash testing is not recommended for routine testing of appliances but may be appropriate after repairs have been carried out.

7. Labelling & Record Keeping.

Once equipment has been tested it should be labelled with a suitable PASS/FAIL test sticker. This label should indicate.

1. Appliance identification number.
2. Test Date.
3. Date of next test due.
4. Initials of tester.

It is recommended that a portable appliance register be maintained which records the test results obtained and the required inspection schedule.

IEC power leads, extension leads and adaptors

To test an IEC power lead (computer power lead etc) plug into the appropriate easypat mains socket and the LEAD TEST socket.

Perform the **Continuity** and **Insulation** tests – if it passes OK then proceed as follows

EPAT2100 - If the lead passes Continuity and Insulation tests then perform a **RUN CURRENT** test. Check the lamp indication against the table on the front panel. The **Run Leakage** test would not normally be carried out on extension leads etc, however if the button is pressed then the display will indicate a value of approx 1.3mA while under test - this is not indicating a fault in the lead but is simply a product of the test current drawn.

EPAT1600 – If the lead passes Continuity and Insulation tests unplug from the EasyPat mains socket and connect to a live mains socket leaving the IEC connector plugged into the lead tester. Check the lamp indication against the table on the front panel. Extension leads should be tested in the same way as an IEC lead - using the adapters where necessary.

Note on 110v/240v operation.

Both machines can test 110V appliances for continuity/earth bond however the 1600 itself can only be powered by 240V- this is not an issue since there is no Run Test facility on this machine. The 2100 can be powered by either 110v or 240V (note that it does not convert between the two) and only the correct socket is powered up during the Run Test. It makes sense therefore to power the 2100 with the same supply voltage as is required by the appliances being tested.