Test Selection	Uses
Class I Equipment (earthed)	
Earth Test	**In conjunction with Earth Return Lead in 25A & 8A sockets.**
500V Flash	**Use where equipment has high capacitance suppression.**
1250V Flash	**For normal Class I equipment.**
Class II Equipment (double insulated)	
2500V Flash	**For testing most audio/visual equipment and items to BS415.**
3000V Flash	**For routine testing.**
3750V Flash	**For testing repaired or reconditioned tools.**
IT (computerised type) equipment.	
Functional Earth	**100mA continuity test (purely functional) NOT a safety test.**
500VDC Megohms	**measures insulation resistance where 'Flash Test' is too severe.**

Pre-test Inspection…
Before putting a piece of equipment through an electrical safety test, carry out the following visual inspections.

Check the full length of the power supply cable for cuts and abrasions, if the outer cable is damaged (i.e. you can see the inner cable colours) replace the cable before testing.

Open the plug and check all wire connections are made, screws for tightness, and that the Live and Neutral (and earth where applicable) **are connected to the correct terminal.**

Where a cartridge fuse is fitted, this must be checked. If it is 'blown' the PAT test will be void. Finally, do make sure you close the plug before testing.

Check for missing or loose screws, damaged or missing parts and worn components.

Testing Class II (Double insulated) **electrical equipment.**

Note that Class II equipment has no earth cable.

Remove any spanners and consumables (blades or drill bits for example) **from the tool** to be tested **then set the tool's ON/OFF switch/es to ON.**

Lay the tool on the workbench test mat and plug the tool into the respective power socket on the PAT.

Select the test voltage suited to the tool (see chart).

Press and hold the TEST button and apply the tip of the test probe to all exposed metal surfaces.

If the Green PASS lamp illuminates and remains illuminated throughout the test, the tool has passed the safety test at the areas where the probe made contact.

The red FAIL lamp illuminating and a continuous buzzing from a fail-warning indicator means that the tool has failed and is unsafe to use.

The PASS or FAIL buzzer indicators remain ON whilst the test button is depressed, once released the PAT resets itself ready for the next test.

Testing Class I (Earthed) **electrical equipment**

Remove any spanners and consumables (blades or drill bits for example) **from the tool to be tested then set the tool's ON/OFF switch/es to ON.**

Lay the tool on the workbench test mat and plug the tool into the respective power socket on the PAT.

Earth Continuity…

Select the Earth Test then connect the earth return clip lead to the appropriate earth return socket (either 25A or 8A). **Clip the end of the lead to an exposed metal part of the tool being tested.**

Prior to pressing the TEST button, ensure that it is depressed for NO MORE THAN 5 seconds, as the PAT's circuitry will over heat and cause irreparable damage. Do not perform more than two tests within a period of one minute.

Press the TEST button for two or three seconds and note the resistance level obtained on the meter. Remember to read from the scale that corresponds to the respective socket (25A or 8A) the earth return clip is connected to.

If the reading is greatly in excess of that expected, the earth lead is either disconnected or frayed.

Disconnect the earth return clip lead from the tool and the PAT, and place somewhere safe.

Flash Test…
Select the test voltage suited to the tool (usually 1250V but do check with the chart).

Press and hold the TEST button and observe the Flash Test lamps.

If the Green PASS lamp illuminates and remains illuminated throughout the test, the tool has passed the safety test.

The red FAIL lamp illuminating and a continuous buzzing from a fail-warning indicator means that the tool has failed and is unsafe to use.

The PASS or FAIL buzzer indicators remain ON whilst the test button is depressed, once released the PAT resets itself ready for the next test.

If a failure is believed to be caused by the presence of a high leakage suppression filter (this MUST be confirmed by the tool's maker) **it is permissible to repeat the test on the lower 500V setting.**

Functional Earth Test…

This is simply to confirm continuity in the earth line.

Select the Functional Earth Test then connect the earth return clip lead to the 100mA earth return socket. Clip the end of the lead to an exposed metal part of the tool being tested.

Press the TEST button for two or three seconds and note the resistance level obtained on the meter. Remember to read from the 100mA scale.

If the reading is greatly in excess of that expected, the earth lead is either disconnected or frayed.

Disconnect the earth return clip lead from the tool and the PAT, and place somewhere safe.

If the tool fails the test, always carry out a re-test after any repairs are carried out.

EQUIPMENT CARE

Never push the equipment beyond its design limits. Carry out all tests for the minimum amount of time possible, do not let the unit overheat.

Keep the equipment clean - you will find this less of a chore if you clean it regularly, rather than wait until the end of the hire period.

When not in use**, store the equipment somewhere clean, dry and safe from unauthorised users** and from thieves.

FINISHING OFF

Switch the power OFF and unplug the unit from the power supply.

Coil up all leads and place neatly within the rear compartment complete with the fault simulator. Close and lock the rear compartment door.

Fold up the front support legs, replace the front panel protective cover then give the unit a final clean up ready for return, to your local HSS Hire Shop.

...any comments?

If you have any suggestions to enable us to improve the information within this guide please fax your comments or write to the Product Manager at the address below
Fax: 020 8687 5001

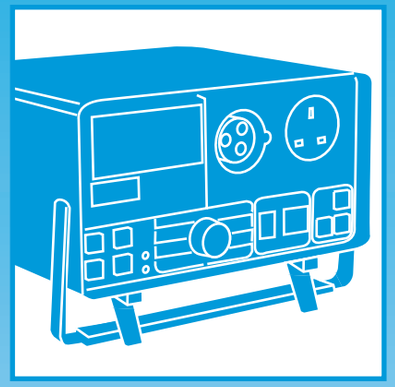
Group Office: 25 Willow Lane, Mitcham, Surrey CR4 4TS

Web Site: http://www.hss.co.uk

Operating & Safety Guide 905

905/03

HSS Hire Shops



Portable Appliance Tester

A portable unit designed to meet strict legal requirements when testing electrical equipment for safety.

Code 67230

GENERAL SAFETY

For advice on the safety and suitability of this equipment **contact your local HSS Hire Shop.**

There is a serious risk of personal injury if you do not follow all instructions laid down in this guide.

This equipment should be used by an able bodied, competent adult who has read and understood these instructions. Anyone with either a temporary or permanent disability, should seek expert advice before using it.

Keep children, animals and bystanders away from the work area. Cordon off a NO GO area using cones and either barriers or tape, available for hire from your local HSS Hire Shop.

Never use this equipment if you are ill, feeling tired, or under the influence of alcohol or drugs.

Wear practical, protective clothing, gloves and footwear. Avoid loose garments and jewellery that could get in the way, tie back long hair.

Warning

If you are wearing an electronic life support device (a heart pacemaker) you must consult your doctor before going near or working with this equipment.

Magnetic fields associated with high currents may affect these devices.

Always switch the power OFF and unplug the equipment from its power supply when not in use.

Ensure the work area is well lit, if in doubt; ask about lighting equipment at your local HSS Hire Shop.

Never carry or pull the equipment by its power supply cable.

Do not work near flammable gases or liquids, petrol or paint thinner fumes for example**. Keep combustible materials at a safe distance -** at least 5m.

Check the condition of the equipment before use. If it shows signs of damage or excessive wear, return it to your local HSS Hire Shop.

ELECTRICAL SAFETY

The HSS Portable appliance tester (PAT) **plugs into a standard 240V 13amp power socket**.

If the equipment fails, or if its power supply cable or plug becomes damaged, return it. Never try to repair it yourself.

Keep cables out of harm's way, and clear of the work area**.**

Extension leads should be fully unwound and loosely coiled, away from the equipment. Never run them through water, over sharp edges or where they could trip someone.

Keep the equipment dry, using electrical equipment in very damp or wet conditions can be dangerous.

To reduce the risk of electric shock, always use a suitable RCD (Residual Current-Operated Device) available from your local HSS Hire Shop. Or power the equipment from a mains circuit with a built in RCD.

Ensure the power socket is switched OFF before plugging the PAT into the power supply.

GETTING STARTED

This guide has been produced to help you set up the PAT and to inform you of its various settings.

If operated by a suitably qualified person, this equipment will satisfy the objectives of the Electricity at Work Regulations 1989. It is presumed that the hirer/operator has the necessary knowledge, experience and qualifications to perform such tasks.

Carefully choose where the PAT is to be positioned.

Site the unit a minimum 30 metres from radio or television receivers or transmitters, 10 metres from computer and other control equipment.

It is also necessary to keep persons wearing hearing aids or fitted with pace makers, at least 3 metres distant (see GENERAL SAFETY).

For your protection against electric shock, both the BENCH AND FLOOR MATS MUST BE USED.

Place the insulating bench mat (supplied) **on a firm surface**, a workbench for example, **where it will create a barrier between the equipment being tested and the bench itself.**

Place the insulating floor mat (supplied) **on the floor area where the operator will stand, to create a barrier between the operator and the floor** (earth).

Place the unit on the bench with the rear facing you, then unlock and open the rear compartment door.

Inside will be found a flash test probe, earth return clip lead, mains power supply cable (fitted with a 13A fuse) **and a fault simulator** (model Y250).

Remove the fault simulator and the earth return clip lead and place somewhere safe until ready to use.

Next **pull out the full cable length of the mains power supply cable and the flash test probe then close and lock the rear compartment door**, ensuring the cables exit each top corner.

Leave the cables to one side and turn the unit around so the front panel is facing you.

Remove the front panel protective cover, swing the carry handle down and under the unit then flick down the two front support legs.

You can now plug the unit into its power supply and switch the supply ON. Note that the PAT has no ON/OFF switch.

BASIC TECHNIQUES

All tests of portable and stationary electrical equipment (class I or II) **will require all fitted switches to be in the ON position.**

Where the switch is of the No Volt Return (NVR) **type, confirm with the manufacturers that holding down the ON button** (usually green) **will close the contacts.**

If the contacts have to be closed from within the switch, that is to say, the switch has to be dismantled to close the contacts, seek advice from the manufacturer as to the safest way to achieve this. If in doubt do not test the tool.

The unit is fitted with two sockets, one 240V 13A to BS1363A and a 110V 16A to BS4343. If the item being tested is fitted with a different plug, you can make a simple adaptor from the respective socket to the items plug (see illustration).

Fault Testing

Before using this equipment, you must perform a fault test to confirm that the unit is working correctly. If this test is not performed, you may be giving the all clear to a faulty piece of electrical equipment you are testing.

Plug the fault simulator into the 13A 240V socket, and the earth return clip lead into the blue 100mA earth return socket (see illustration).

Attach the clip to the two contacts marked 'EC CLIP'; found on the lower left of the fault simulators front cover.

Set the selector to 'Functional Earth' and press the test button. The meter should read 0.2 ohms in the 100mA scale. Release the test button.

Plug the earth return clip lead into the yellow 8A earth return socket. Set the selector switch to the 'Earth Test' position, press the test button, the meter should read 0.2 ohms in the 8A scale. Release the test button.

Plug the earth return clip lead into the green 25A earth return socket and repeat the test. The meter should read 0.2 ohms in the 25A scale. Release the test button.

With the clip attached to the two contacts marked 'EC CLIP', set the selector to '500V flash' and press the test button. A brief red fault lamp will be seen, then the green 'flash pass' lamp must illuminate.

Next turn the selector to '1250V flash' and press the test button. This time the red 'flash fail' lamp must illuminate and a warning buzzer must be heard.

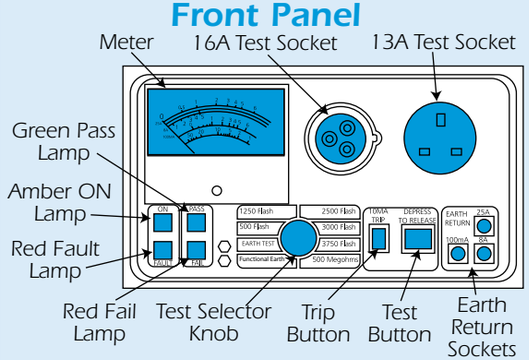
Disconnect the earth return clip lead from the unit and the fault simulator and place somewhere safe.

Turn the selector to '3750V flash' then press and hold the test button. The green 'flash pass' lamp must illuminate. Now apply the test probe's tip to the 'HT PROBE' test point (found on the lower right of the fault simulators front cover).

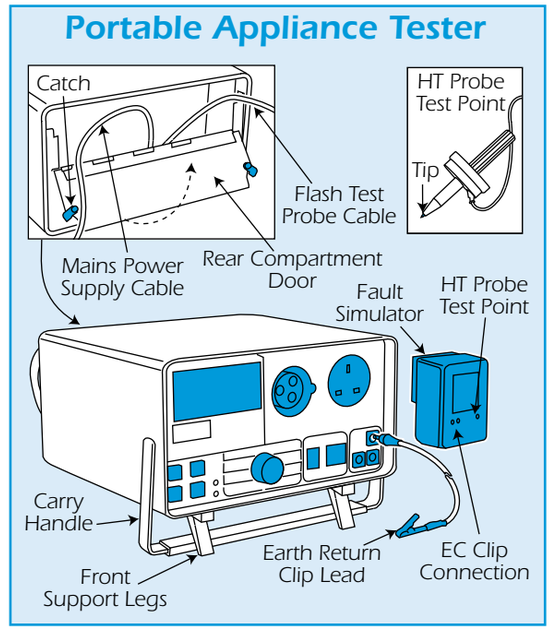
As before, the red 'flash fail' lamp must illuminate and a warning buzzer must be heard. Release the test button.

If the results of any of these tests differ from the above instruction, DO NOT USE THE UNIT, return it to your local HSS Hire Shop for a replacement.

Front Panel



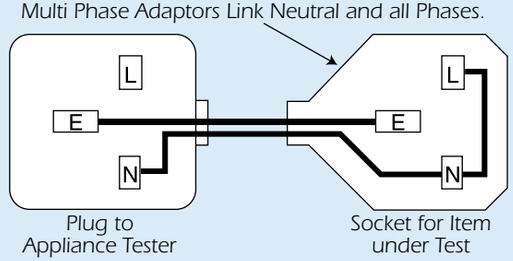
Portable Appliance Tester



Test Socket Adaptor

Single Phase Adaptors Link Neutral and Line.

Multi Phase Adaptors Link Neutral and all Phases.



Inter-connection and link wires must be kept as short as is practical and must be suitably rated to withstand the high current and high voltages that will be present during a safety test.

With the unit connected to its power supply, **switch the supply ON, the amber 'ON' lamp must illuminate.**

If the red 'FAULT' lamp illuminates, DO NOT USE THE UNIT. This indicates a fault in the supply. The fault would be either a lack of earth connection or a reverse polarity of the Live and Neutral have a qualified electrician rectify the fault.

If neither lamp illuminates, check the power supply is switched ON then check the units fuse (replace with a 13A fuse to BS1362).