

HPAT425 HANDYPAT TESTER

Instruction Manual



MARTINDALE
ELECTRIC

Keeping You Safe



 **ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING**

WARNING

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.

In order to avoid the danger of electrical shock, it is important that proper safety measures are taken when working with voltages exceeding the extra low voltage 50V (25V) RMS AC or 120V (60V) DC. The values in brackets apply to restricted voltage ranges (for example in the medical or agricultural sector).

This portable appliance tester must only be used by a skilled and competent person capable of interpreting the results under the conditions and for the purposes for which it has been constructed, and who is familiar with the relevant regulations, the safety risks involved and the consequent normal safe working practices, and under the conditions and for the purposes for which it has been constructed and specified. Particular attention should be paid to the Warnings, Precautions and Technical Specifications. Always check the unit is in good working order before use and that there are no signs of damage to it. Do not use if damaged.

Where applicable other safety measures such as use of protective gloves, goggles etc. should be employed.

Please keep these instructions for future reference. Updated instructions and product information are available at:
www.martindale-electric.co.uk/manuals

REMEMBER: SAFETY IS NO ACCIDENT

Meaning of Symbols and Markings



Caution - risk of danger and refer to instructions



Caution - risk of electric shock



Equipment protected by double or reinforced insulation (Class II)



AC (Alternating current)



Equipment complies with relevant EU Directives



Equipment complies with relevant UK Conformity Assessed marking



End of life disposal of this equipment should be in accordance with relevant Directives.

CONTENTS

1	Introduction	3
1.1	Unpacking and inspection	3
1.2	Description & overview	3
2	General operation & functions	4
2.1	Precautions	4
2.2	Power on / off	5
2.3	Battery charge	6
2.4	Connector descriptions	7
2.5	Menu and button descriptions	8
2.5.1	Screen descriptions	9
2.6	Auto power down	12
2.7	Inadvertent connection of mains supply voltage	12
3	Performing appliance & lead tests	13
3.1	Preliminary checks and set up	13
3.2	IEC lead test	14
3.3	Class I test	15
3.4	Class II test	17
3.5	Extension lead testing	18
3.6	Earth continuity / insulation failure	19
3.7	Testing of 110V appliances	20
3.8	110V extension lead testing	22
4	Maintenance	24
4.1	Calibration	24
4.2	Cleaning	24
4.3	Repair & service	24
4.4	Storage conditions	24
5	Warranty Specification	25

1. INTRODUCTION

1.1 Inspection

Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage, then consult your distributor immediately.

Unpack the HPAT and check that you have the following accessories:

- Instructions
- Test Probe with crocodile clip (TL67)
- IEC Adaptor Lead (EX332)
- USB-A to USB-C charging cable

1.2 Description & Overview

The battery powered HPAT425 is a Portable Appliance Tester with the following features:

Dual insulation test voltage

The insulation measurement test voltage can be set to either 500V or 250V.

IEC Lead Test

The HPAT425 can also be used to check IEC leads and extension leads for earth continuity, insulation, and correct polarity, (the Martindale EX332 Adapter lead is required for extension lead testing).

Test types

The HPAT425 will perform the following test types:

- IEC Lead test sequence
- Class I test sequence
- Class II test sequence

2. GENERAL OPERATION & FUNCTIONS

2.1 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use.

If this equipment or the supplied accessories are used in a manner not specified by Martindale Electric, the protection provided by the equipment may be impaired.



WARNINGS

Before use check the unit for cracks or any other damage. Make sure the unit is free from dust, grease and moisture. Also check any associated leads and accessories for damage. Do not use if damaged. Be sure the HPAT is in good working order before use.

Only accessories that are supplied and meet the specific characteristics provided by Martindale Electric should be used.


The HPAT and this Instruction Manual are intended for use by personnel who are adequately trained and familiar with the 'IET Code of Practice for In-service Inspection and Testing of Electrical Equipment'.

Do not connect the HPAT to the mains supply via the IEC inlet.


Do not touch the appliance being tested or the test probe tip when the HPAT is performing an electrical test. Where possible, use the crocodile clip provided to attach the probe to the appliance.

Avoid severe mechanical shock or vibration and extreme temperature.

2.2 Power on / off

Hold down the green power button  for at least 2 seconds to power on the HPAT. The HPAT will power on with the following display.



To power off the HPAT hold down the green power button for at least 3 seconds until 'Release the POWER button to switch off' is displayed on the screen. Then release the **Power**  button to turn off the HPAT.

2.3 Battery Charge

0-25%



>25 - 50%



>50 - 75%





>75 - 100%

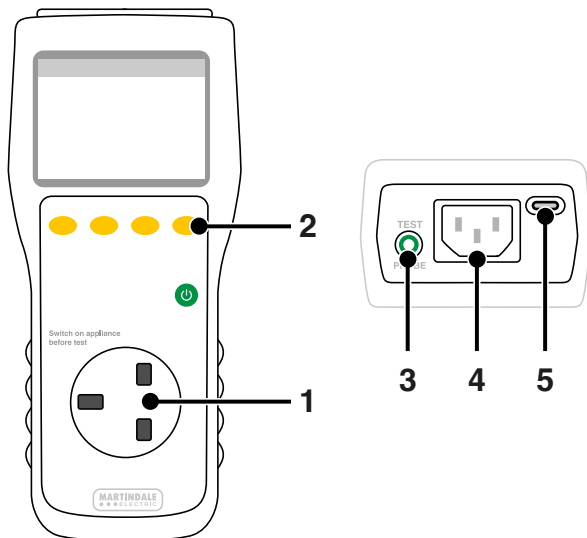


Fully charged

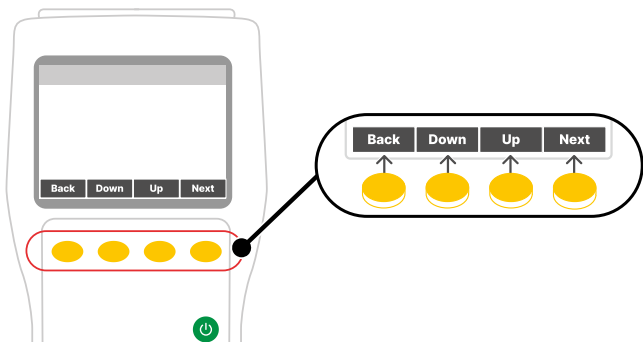


2.4 Connector descriptions

1. Front panel three pin socket outlet – Used to connect the appliance under test
2. Select / function buttons
3. 4.0mm Probe connector – used for earth continuity/class II insulation test probe.
*Recessed reset button – used to reset the internal processor.
4. IEC Input socket – used for IEC lead testing.
 **Do not connect to a mains socket outlet supply**
5. USB-C Input connection – used for battery charging
 **The HPAT will not operate while the USB charging cable is plugged in**

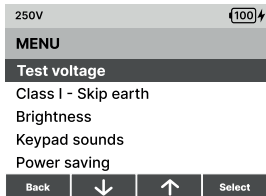


2.5 Menu & button descriptions



The top row of yellow selection buttons can be used to select and scroll through the various settings and menu options.

Menu options



Test voltage: Allows selection of 500V or 250V test voltage.

Class 1 skip earth: Enable the skip earth test function. Only used when there are no metal contact points available on an appliance.

Brightness: Allows the user to adjust the brightness of the display.

Keypad sounds: Enable or disable the key press sound.

Power saving: Enable / disable the auto dim and 5 minute power off battery saving function

2.5.1 Screen descriptions

Menu bar

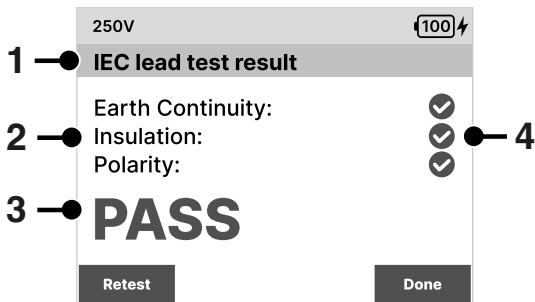


1. Insulation Voltage
2. Battery charge (%)
3. HPAT charging



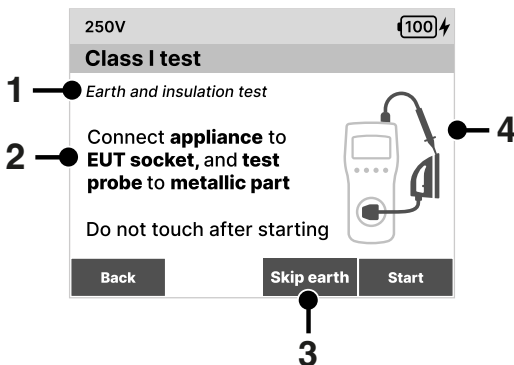
The HPAT will not operate while the USB charging cable is plugged in

Test result screen



1. Test sequence type
2. Individual test results
3. Sequence test result
4. Test result icons

Start test screen



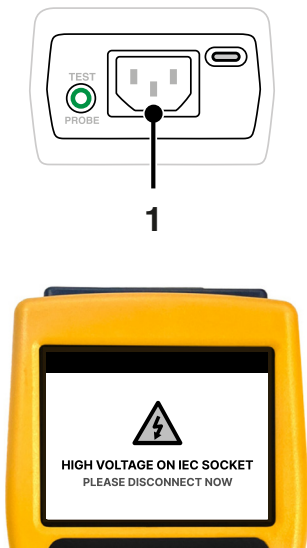
1. Description of test
2. Connection instructions
3. 'Skip earth' option for when no metal is available
4. Test diagram

2.6 Auto power down

If the HPAT remains inactive for a period of 3 minutes, auto dimming of the LCD screen will start and the message 'Auto power down' will be displayed on the screen before auto power down after 5 minutes of inactivity.

2.7 Inadvertent connection of mains supply voltage

If mains voltage is inadvertently applied to the HPAT, via the IEC socket (1) at the top end, an error message will be displayed as per the diagram below and the HPAT will power down after approximately 3 seconds. All HPAT buttons will be inhibited until the source of the applied voltage is removed.



3.PERFORMING APPLIANCE & LEAD TESTS



WARNING

The HPATs and this instruction manual are intended for use by personnel who are adequately trained and familiar with the 'IET Code of Practice for in-service Inspection and Testing of Electrical Equipment'.

3.1 Preliminary checks and set up



Ensure that the appliance is NOT plugged into the mains supply when removing fuses.

Appliance Visual and Fuse Checks:

- Visually inspect the appliance for any damage.
- Visually inspect the appliance mains lead and mains plug for any damage.
- Check that the fuse in the mains plug is of the correct rating.
- Check that any accessible fuses on the appliance are of the correct rating.
- **DO NOT** proceed with electrical testing if any of the visual or fuse checks fail.

IEC Lead/Extension Lead Visual and Fuse Checks

- Visually inspect the lead and plug for any damage.
- Visually inspect the extension lead socket for any damage.
- Check that the fuse in the plug is of the correct rating.
- **DO NOT** proceed with electrical testing if any of the visual or fuse checks fail.

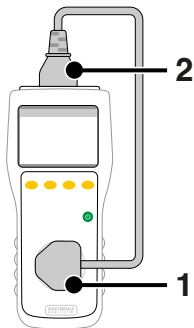
3.2 IEC Lead Test



Always refer to and perform 3.1 before proceeding

The following are performed:

- **Earth continuity measurement** - measures the resistance of the lead earth.
- **Insulation measurement** - measures resistance between earth and line and between earth and neutral.
- **Wiring polarity check** - checks for open or short circuit wiring and crossed wiring.



Test connections

Refer to the IEC Lead connection diagram above.

- Plug the IEC lead plug into the HPAT's front panel socket outlet (1).
- Connect the other end of the IEC lead to the HPAT's IEC input socket (2)
- From the main screen select **Lead** after a visual check. After the visual check is satisfactory press **Start** to begin the test.

3.3 Class I Test



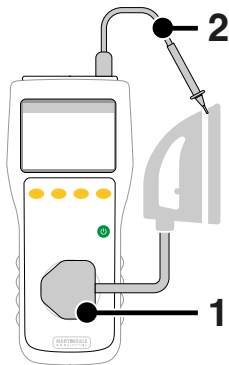
Always refer to and perform 3.1 before proceeding

The following are performed for a Class I appliance test:

- **Fuse check** - checks fuse continuity.
- **Class I earth continuity measurement** - measures resistance between earth and exposed metalwork.
- **Class I insulation measurement** - measures resistance between earth and line and between earth and neutral.

Test connections

- Refer to the Class I connection diagram below.
- Plug the appliance mains plug into the HPAT's front panel socket outlet (1).
- Connect the test probe to the HPAT's 4mm test probe connector (2) and connect the other end to any exposed metal work on the appliance.
- If the appliance being tested has more than one instance of exposed metalwork, it is advisable to connect the test probe to each area in turn and perform a new test to check earth continuity.



Class I ‘Skip earth’

When about to begin a Class I test, there is an option to skip the earth test. This should only be done if:

- There is no exposed metal - this could be due to plastic casings .
- It has a functional earth - some equipment may utilise its earth for functionality and not for safety
- Coated metal - all of the appliance’s metal components are covered in a non conductive film, paint or powder-coated surface.



A damaged or broken earth path results in a FAIL

The appliance should be removed from service and clearly labelled ‘DO NOT USE’ before quarantining it to prevent accidental use.

3.4 Class II Test



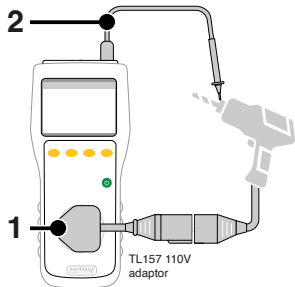
Always refer to and perform 3.1 before proceeding

The following are performed for a Class II appliance test:

- **Insulation measurement** - measures resistance between live and exposed metalwork and between neutral and exposed metalwork.

Test connections

- Refer to the Class II connection diagram below.
- Plug the appliance mains plug into the HPAT's front panel socket outlet (1).
- Connect the test probe to the HPAT's 4mm test probe connection (2) and connect the other end to any exposed metal work on the appliance.
- If the appliance being tested has more than one instance of exposed metalwork, it is advisable to connect the test probe to each area in turn and perform a new test to check earth continuity.
- Where the appliance being tested has multiple areas of possible insulation breakdown, such as cooling slots or cover joints, it is suggested to wrap metal foil tightly around the appliance and connect the test probe to the metal foil then perform Class II insulation tests.



3.5 Extension Lead Testing



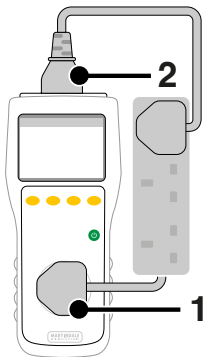
Always refer to and perform 3.1 before proceeding

To test extension leads the HPAT's IEC Lead Test is used with connections as detailed below.

A Martindale EX332 IEC mains lead (or similar) is required to perform extension lead tests.

Test connections

- Refer to the Extension Lead connection diagram below.
- Plug the extension lead plug into the HPAT's front panel socket outlet (1).
- Plug the EX332 IEC lead mains plug into the extension lead socket.
- Connect the other end of the EX332 IEC lead to the HPAT425 IEC input socket (2).



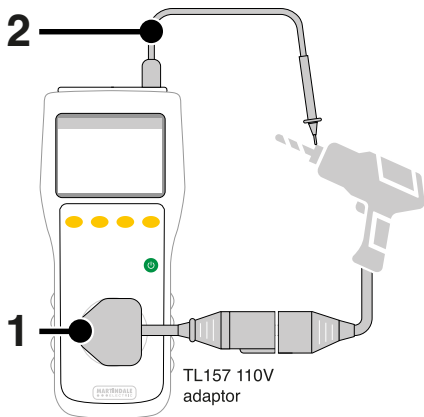
3.6 Earth continuity / insulation failure

Possible reasons for failure other than a faulty appliance or lead:

- Appliance or lead being tested not correctly connected to the HPAT.
- Test probe is not making good contact with the appliance.
- Pass levels are not correct for the type of appliance or lead being tested.
- Null of the test probe lead resistance incorrect

3.7 Testing of 110V appliances

A TL157 PAT 110V Adaptor (available separately) is required for testing 110V appliances (yellow BS 4343 16A 110V plug). Refer to the connection diagram below.



Ensure that the appliance is switched ON. Undertake a test sequence as appropriate for the appliance (See 3.1 to 3.4).

NOTE: Connect the test probe to the HPAT's 4mm test probe socket (2) and connect the probe to the appliance appropriately, according to the test descriptions in sections 3.1 to 3.4.

NOTE: The TL157 PAT 110V Adaptor has a special configuration of internal connections to enable the safe testing of Earth Continuity and of Insulation resistance for 110V appliances.

However, for reasons of safety, the TL157 will not allow a 110V appliance to draw any run current through the socket Outlet (1). (This is to prevent inadvertent connection of a 110V appliance to 230V mains).

For this reason, the test of a 110V appliance using the TL157 will always result in a FAIL at the Load check.

Check that the appliance is switched on. Begin the test again if necessary. The user should also have checked the fuse. Assuming such checks above have been made, the Class I or Class II appliance test sequence can be continued beyond the simulated load check result by selecting **Continue**.

NOTE: A load test is always carried out to check that the appliance is switched on and that there is a path for electricity to flow.

3.8 110V Extension Lead Testing



Always refer to 3.1 and perform visual extension lead checks before proceeding

To test 110V extension leads, the HPAT's lead test is used with connections as detailed in 3.5. Also refer to 3.2 (IEC Lead Test).

A Martindale EX331 IEC to 110V adaptor lead, plus TL157 PAT 110V adaptor is required to perform 110V extension lead tests.

Test Connections

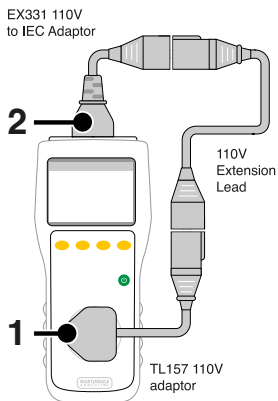
- Refer to the 110V Extension Lead connection diagram under 3.5.
- Plug the TL157 110V adaptor into the HPAT's front panel socket outlet (1).
- Connect the TL157 coupler to the 110V plug of the 110V extension lead under test.
- Plug the EX331 110V plug into the coupler of the 110V extension lead under test.
- Connect the other end of the EX331 to the HPAT's IEC input socket (2).
- Ensure that any switches are set to ON.
- Undertake a Lead test (3.2)

NOTE: The TL157 PAT 110V Adaptor has a special configuration of internal connections to enable the safe testing of earth continuity and of insulation resistance for 110V appliances.

However, for reasons of safety, the TL157 will not allow a 110V extension lead to draw any run current through the mains socket (1). (This is to prevent inadvertent connection of a 110V appliance to 230V mains).

For this reason, the lead test of a 110V lead using TL157 will always result in a FAIL on polarity.

The lead test will have shown that the earth continuity is satisfactory, and will have tested that the Insulation is satisfactory between centre tapped earth and the two live 55V conductors. If both earth and insulation tests PASS, the extension lead is proven electrically safe, assuming the visual inspection was passed. Because the concept of polarity is irrelevant on 55-0-55, the failure of the polarity test can be ignored.



4. MAINTENANCE

4.1 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved calibration laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.

Email: service@martindale-electric.co.uk

Tel: +44 (0)1923 650660

4.2 Cleaning

If contamination is found, clean with a damp soft cloth and if necessary, a mild detergent. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

4.3 Repair & service

There are no user-serviceable parts in this unit. Return to Martindale Electric if faulty. Our service department will quote promptly to repair any fault that occurs outside the warranty period.

4.4 Storage conditions

The instrument should be kept in warm, dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a toolbox where other tools may damage it.

5. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's reasonable opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale.

Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

Nothing in this statement reduces your statutory rights.



EARTH CONTINUITY

Test voltage: >4V DC (into open circuit)

Test current: >200mA DC

(into short circuit)

Pass limits:

≤0.1Ω

0.11Ω to ≤0.30Ω long lead

0.31Ω to ≤0.50Ω extra long lead

INSULATION

Default test voltage:

>500V DC at 1mA (< 625V DC into open circuit)

User selectable test voltage:

>250V DC at 1mA (< 312.5V DC into open circuit)

Test current: 2mA (into short circuit)

Pass level:

Lead: ≥1.0 MΩ

Class I: ≥1.0 MΩ

Class II: ≥2.0 MΩ

GENERAL

Overload protection: 300V AC / DC

Protection class: IP20

Safety: Complies to BS EN 61010-1

POWER

Batteries: 3.7V 5000mAh lithium polymer battery (non-user replaceable)

Battery life: Fully charged, minimum 1700 complete tests approx.

Auto Power Down:

Auto dimming after 3 minutes, Auto power down after 5 minutes of inactivity

ENVIRONMENTAL

Location: Suitable for indoor use, and outdoor use in dry weather conditions only

Altitude: Up to 2000m

Operating temperature: 0°C to 40°C

Humidity: ≤ 80% RH up to 31°C, decreasing linearly to 50% RH at 40°C

Ingress protection class: IP20

Pollution degree: 2

Check out what else you can get from Martindale:

- 18th Edition Testers
- Accessories
- Cable Locators
- Calibration Equipment
- Continuity Testers
- Digital Clamp Meters
- Digital Multimeters
- Electricians' Kits
- Environmental Products
- Full Calibration & Repair Service
- Fuse Finders
- Labels
- Microwave Leakage Detectors
- Multifunction Testers
- PAT Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Safe Isolation Kits
- Socket Testers
- Specialist Drummond Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators

Martindale Electric Co. Ltd. Metrohm House,
12 Imperial Park, Imperial Way, Watford WD24 4PP, UK.

T: +44 (0)1923 441717

www.martindale-electric.co.uk sales@martindale-electric.co.uk

Ver. G1.0

Due to our policy of continuous development, Martindale Electric reserves the right to alter equipment specification and description outlined in this document without prior notice. No part of this document shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract. © 2026 Martindale Electric Co. Ltd. Registered in England No. 3387451. LITHPAT425