DRAPER®

EN

Original Instructions
Version 1

6-30V AUTOMOTIVE DIAGNOSTIC PROBE

23820

UK CA CE

1. Preface

These are the original product instructions. This document is part of the product; retain it for the life of the product, passing it on to subsequent holders. Read this manual in full before attempting to assemble, operate or maintain this product.

This Draper Tools manual describes the purpose of the product and contains all the necessary information to ensure its correct and safe use. Following all the instructions and guidance in this manual will ensure the safety of both the product and the operator and increase the lifespan of the product.

All photographs and drawings within this manual are supplied by Draper Tools to help illustrate correct operation of the product.

Every effort has been made to ensure the information contained in this manual is accurate. However, Draper Tools reserves the right to amend this document without prior warning. Always use the latest version of the product manual.

1.1 Product Reference

User Manual for: 6-30V Automotive Diagnostic Probe

Stock No: 23820

Part No: AP2

1.2 Revisions

Version 1: May 2024
First release

As our manuals are continually updated, always ensure that the latest version is used.

Please visit **drapertools.com/manuals** for the latest version of this manual and the associated parts list, if applicable.

1.3 Understanding the Safety Content of This Manual

WARNING! – Situations or actions that may result in personal injury or death.

CAUTION! – Situations or actions that may result in damage to the product or surroundings.

Important: – Information or instructions of particular importance.

2. Contents

3. Product Introduction

3.1 Intended Use

This tester is designed to carry out diagnostics quickly and effortlessly on 6 to 30V electrical systems and continuity testing of earth connections. Pre-set modes for testing DC and AC voltage, resistance and diodes. Vehicles components can be activated when fitted or prior to installation. The tester can be connected directly to the vehicle battery using the clamps or via the vehicle's 12V DC socket with the adaptor provided.

This product is suitable for use by enthusiasts and tradespersons alike.

Any other application beyond the conditions established for use will be considered misuse. Draper Tools accepts no responsibility for improper use of this product.

3.2 Specification

Stock No.	23820
Part No.	AP2
Voltage Supply	12 or 24V DC (vehicle battery)
Net Weight	323g
Tester Dimensions (L X W X H)	155 X 40 X 30mm
Tester Cable Length	6m
Tester Extension Cable Length	6m
Probe Length	90mm
Tester Cables Diameter	5mm
Positive & Negative Lead Length	400mm
12V DC Adaptor Lead Length	30mm
Operating Temperature	0 to 60°C
DC Voltage Range	0 – 65V +1 digit
Resistance Range	0 – 200KΩ
Frequency Range	0 - 10Khz

4. Health and Safety Information

Important: Read all the Health and Safety instructions before attempting to operate, maintain or repair this product. Failure to follow these instructions may result in injury or damage to the user, the product or the vehicle.

- **ALWAYS** follow the instructions and procedures listed in the vehicle's service manual before using this device.
- **ALWAYS** perform automotive testing in a safe and well-ventilated work area with adequate lighting.
- **DO NOT** connect or disconnect the tester while the ignition is 'ON' or the engine is running.
- **DO NOT** drive or move the vehicle while using the tester.
- Exceeding the limits listed in this manual may cause physical injury or permanent damage to the device, part and circuits being tested.
- **DO NOT** use this device if the tester, leads or probe are damaged in any way.
- Ensure the parking brake is engaged and in 'Park' for automatic transmission.
- **NEVER** leave the vehicle unattended while carrying out tests and put blocks in front of the drive wheels.

CAUTION! Take care when working near the ignition coil and wires, distributor cap and spark plugs. These components create hazardous voltages when the engine is running.

- **ALWAYS** wear suitable eye protection.
- Keep clothing, hair, hands, tool and test equipment away from all moving and hot engine parts.
- After checking the vehicle, ensure that all the disconnected connections are correctly restored.

WARNING! DO NOT attempt to repair or service unless qualified to do so.

5. Explanation of Symbols

Read the instruction manual

Warning!

WEEE –

Waste Electrical & Electronic Equipment

Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish

6. Identification and Unpacking

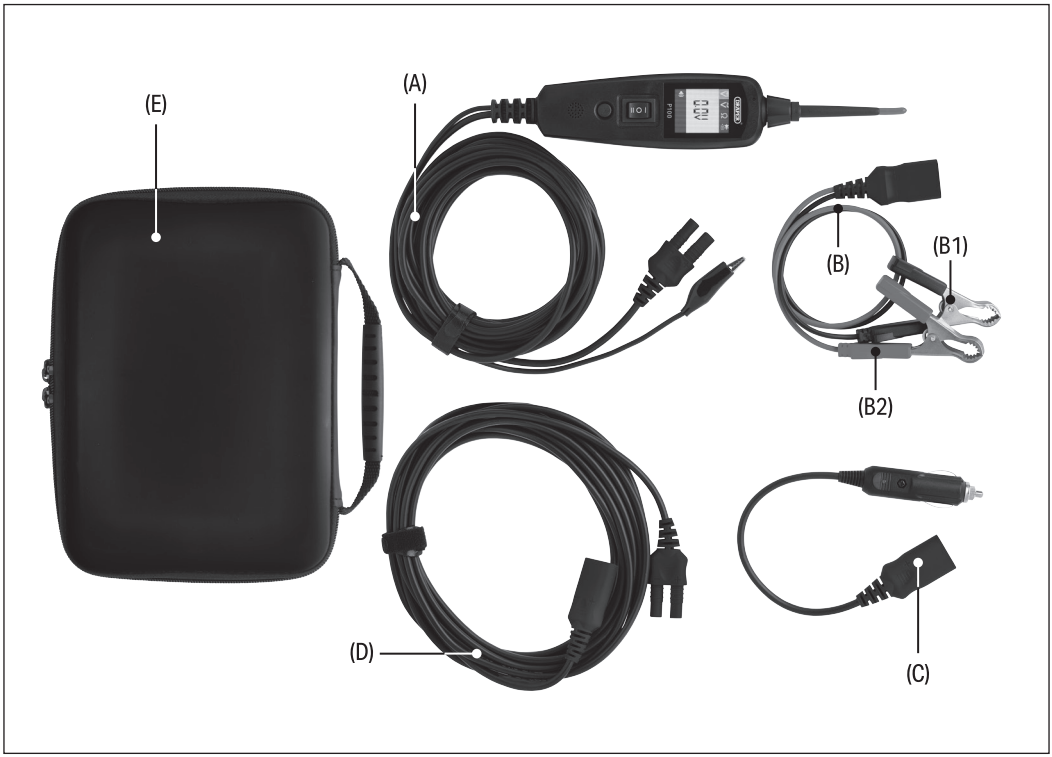
6.1 Product Overview

(1) Probe tip with cover
(2) Flashlight
(3) Red polarity indicator
(4) Green polarity indicator
(5) LCD display screen
(6) Power switch
(7) Mode button
(8) Speaker
(9) Power adaptor connector
(10) Auxiliary ground lead

6. Identification and Unpacking

6.2 What's in the Box?

Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment. If any part is damaged or missing, do not attempt to use the product. Please contact the Draper Helpline; contact details can be found at the back of this manual.



(A) Tester
(B) Power adaptor
(B1) (-) Negative (black) lead and clamp
(B2) (+) Positive (red) lead and clamp
(C) 12V DC Adaptor
(D) 6m Extension cable
(E) Storage case

6.3 Packaging

Keep the product packaging for the duration of the warranty period for reference should the product need to be returned for repair.

WARNING! Keep packaging materials out of reach of children. Dispose of packaging correctly and responsibly and in accordance with local regulations.

Please visit **drapertools.com** for our full range of accessories and consumables.

7. Preparation

7.1 Connecting to the Power Supply

- The tester can be powered via either the vehicle's battery or 12V DC socket.

1. **Vehicle Battery Adaptor (B) -** Connect the red (+) clip (B2) to the positive terminal of the battery and the black (-) clip (B1) to the negative terminal. The tester will beep and the light (2) will come on when connected.
2. **12V DC Power Adaptor (C)** – plug into the vehicle's 12V DC power socket.
   Note: Some vehicles may require the ignition to be on to power the 12V socket.

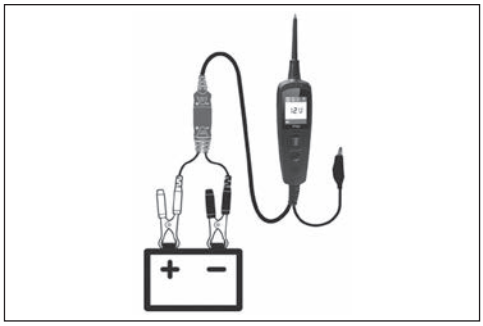


Fig. 1

7.2 Fitting the Probe to the Tester

- Fit the probe (1) to the tester and turn to secure in place.

7.3 Self Test

1. Before using the tester carry out the self testing procedure.
2. With the tester connected to the power supply, push the power switch (6) forward to the 'I' position. The probe tip (1) will activate with a positive voltage. The red indicator (3) will come on and the screen will display the battery voltage. If the speaker (8) function is switched on a high pitch tone will sound. Release the power switch to turn off.
3. Then push the power switch (6) back to the 'II' position to activate the tip with a negative voltage. The green indicator (4) will come on and the screen will display '0.0' (ground). If the speaker (8) function is switched on a low pitch tone will sound. Release the power switch to turn off.
4. The tester is ready for use.

8. Operation

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Important: When powering up components, always press the power switch (6) first and then contact the tip with the component.

WARNING! To avoid damage to the electronic components, ALWAYS refer to the vehicle manufacturer's schematic and diagnosing procedure before testing.

8.1 Circuit breaker

- The tester is fitted with an automatic short circuit protection which will break the circuit and restart the tester in the event of an overload or short circuit.

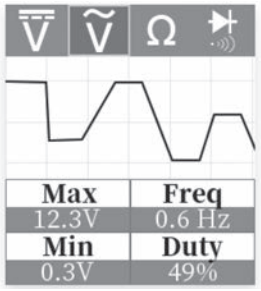
8.2 Red (3) & Green (4) Polarity Indicators

- The polarity indicators will light up when the probe tip voltage matches the battery voltage within +/- 8volts. It the circuit being tested is not within the tolerance, the voltage reading will be displayed but neither of the indicators will light up.

8.3 Pre-set Test Modes

- There are four pre-set modes to diagnose the electrical system which can be accessed by pressing the mode button (7) and cycling through.

8. Operation

Mode	Action	Screen
DC Voltage	Contact a circuit with the probe tip. The DC voltage will be displayed on the screen. Check components prior to installation. Trailer light and connections.	
AC Voltage	Contact a circuit with the probe tip. The MAX and MIN voltage, frequency (Hz) and duty cycle will be displayed on the screen.	
Resistance	Contact a circuit with the probe tip. The resistance between the tip and the ground lead will be displayed on the screen.	
Speaker Tone ON/OFF	Press the mode button once to switch between tone 'ON' and 'OFF'. 'ON' – short high pitch beep 'OFF' – short low pitch beep	

8.4 Voltage & Polarity Testing

- Select the DC voltage mode and contact the probe tip to a positive circuit. The red indicator (3) will come on and the screen will display the voltage. If the speaker (8) is switched on a high pitch tone will sound.
- Contact the probe tip to a negative circuit. The green indicator (4) will come on and the screen will display the voltage. If the speaker (8) function is switched on a low pitch tone will sound.

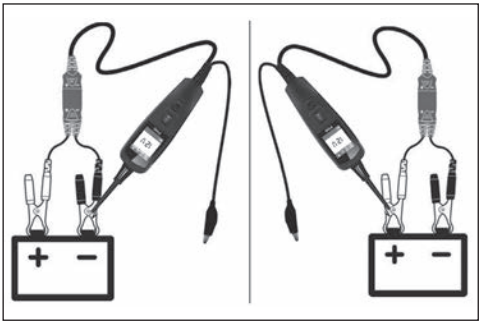


Fig. 2

8.5 Continuity Testing

- Select resistance mode. Use the probe tip with either the chassis ground or the auxiliary ground lead (10) to test the continuity of wires and components. Either test connected or disconnected from the vehicle's electrical system.
- When connected to a good ground, the screen will display 0.0Ω, the green light will be on and a low pitched tone will be heard.
- If the resistance value is greater than 200KΩ the screen will display 'OL'.
- Continuity can also be checked by using the power switch. If the circuit breaker trips there is a good solid low resistance connection.
- **Note:** The probe tip can pierce plastic insulation on a wire so that the circuit can be tested without disconnecting anything.

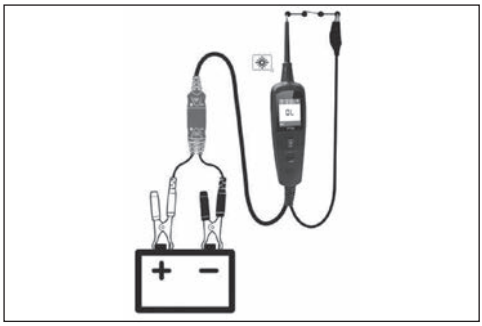


Fig. 3

8.6 Testing Components Prior to Installation

1. Whilst in DV voltage mode components can be activated prior to fitting to test functioning correctly.
2. Contact the auxiliary ground lead (10) to the negative terminal or ground side of the component being tested. Then contact the probe tip to the positive terminal of the component. The Green indicator (4) should light up.
3. Push the power switch forward to the 'I' position and release. If the green light goes out and the red indicator (3) come on it is ready to activate further. Push and hold the power switch forward to provide power to the component.

- If the green indicator goes out instantly or the circuit breaker trips the tester has been overloaded for the following reasons:
  - Contact being probed is direct ground or negative voltage.
  - Component being tested has short circuited.
  - Component is very high current (i.e. starter motor)
- If the circuit breaker trips, reset by allowing the tester to cool down for at least 15 seconds.

8.7 Testing and Activating Vehicle Fitted Components

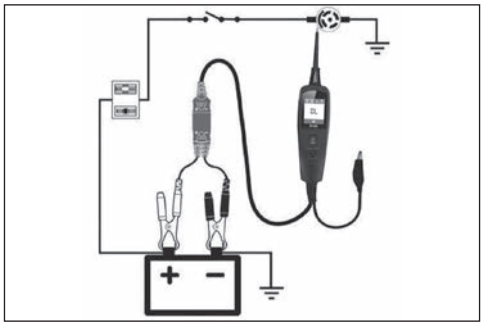


Fig. 4

1. Select DV voltage mode.
2. Contact the probe tip (1) with the positive terminal of the component being tested. The Green indicator (4) should light up.
3. Then push the power switch forward to the 'I' position and release. If the green light goes out and the red indicator (3) come on it is ready to activate further. Push and hold the power switch forward to provide power to the component.

- If the green indicator goes out instantly or the circuit breaker trips the tester has been overloaded for the following reasons:
  - Contact being probed is direct ground or negative voltage.
  - Component being tested has short circuited.
  - Component is very high current (i.e. starter motor).
- If the circuit breaker trips, reset by allowing the tester to cool down for at least 15 seconds.

8.8 Trailer Lights and Connections Testing

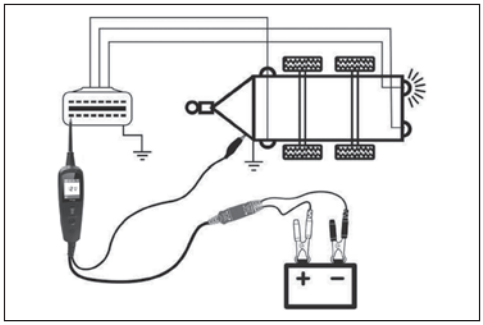


Fig. 5

1. To check the function and orientation of the connector and trailer lights, select the DC voltage mode.
2. Then clip the auxiliary ground lead to the ground on the trailer, probe the contacts and apply voltage to the probe tip.

- If the circuit breaker trips, the contact is likely ground. Reset by allowing the tester to cool down for at least 15 seconds.

8.9 Activating and checking Components With Ground

WARNING! With this function if contacting a protected circuit a vehicle fuse may blow or trip if you apply ground to it.

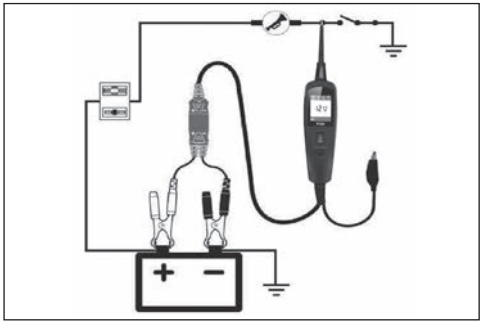


Fig. 6

1. Select DC voltage mode and contact the probe tip to the negative terminal of the component. The red indicator (3) will light up.
2. Then push the power switch back to the 'II' position and release. If the red light goes out and the green indicator (4) come on it is ready to activate further.

- If the green indicator goes out instantly or the circuit breaker trips the tester has been overloaded for the following reasons:
  - Contact being probed is direct positive voltage.
  - Component being tested has short circuited.
  - Component is very high current (i.e. starter motor).
- If the circuit breaker trips, reset by allowing the tester to cool down for at least 15 seconds.

8. Operation

8.10 Checking for Poor Ground Contacts

- Probe the suspected ground wire or contact with the probe tip.
- Observe the green indicator (4) and push the power switch forward to the 'I' position. If the green indicator goes out and the red indicator comes on it is not a true ground.
- If the circuit breaker trips the circuit is most likely a good ground. Note: high current components such as starter motor can also trip the circuit breaker.

8.11 Following And Locating Short Circuits

In most cases a short circuit will be caused by a blown fuse or electrical protection devise tripping.

1. To check, first remove the fuse from the fuse box.
2. Use the probe tip to activate each fuse contacts. The contact that trips the circuit breaker is the shorted circuit. Note the wire colour or identification code.
3. Follow the wire as far as possible along the wiring harness. Repeat this process until the short is located.

9. Maintenance, Returns and Disposal

WARNING! Do not attempt to repair or service this product. Any servicing or repairs must be carried out by a qualified person.

- Wipe the case with a damp cloth and a mild detergent. **DO NOT** use solvents or abrasives to clean the tester.
- Store the device in the case supplied (E) in a cool, clean and dry environment, out of direct sunlight and out of reach of children.
- Keep the product clean and free from dust, debris and grease.
- At the end of its working life, dispose of the product responsibly and in line with local regulations. Recycle where possible.
- **DO NOT** dispose of this product with domestic waste; most local authorities provide appropriate recycling facilities.

10. Warranty

12 months -
Visit **drapertools.com/warranty** for full details

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