



USER MANUAL



SP62012

**DIGITAL
MULTIMETER
ELECTRICAL**

**RETAIN THESE INSTRUCTIONS
AND ATTACH RECEIPT TO
MANUAL FOR FUTURE
REFERENCE**

NOTE: Proof of purchase must be retained by the customer as it will be required in the event of a claim under warranty.

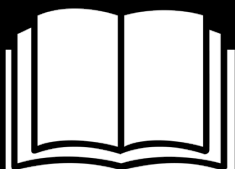


AFTER SALES SUPPORT:

WWW.SPTOOLS.COM

AUSTRALIA: Visit the website's **contact page** to get in touch with your local service department.

INTERNATIONAL: Use the **county selector** to get in touch with your service department in your country or region.



IMPORTANT

ALL PERSONS WHO ARE TO USE THIS EQUIPMENT MUST THOROUGHLY READ AND UNDERSTAND THIS INSTRUCTION MANUAL PRIOR TO OPERATION.

CONTENTS

Product Overview	2
Technical Specifications	3
Features	4
Intended Use	5
Safety Information.	6
Safety Symbols.	6
Operating instructions	7
DC Voltage.	7
DC Current.	7
AC Voltage	8
Diode and Continuity	8
Resistance	9
Transistor hFE Test	9
DC Voltage Measurement	9
DC Current Measurement	10
AC Voltage Measurement	10
Resistance Measurement	10
Diode Test	10
Transistor Test	11
Audible Continuity Test	11
Battery & Fuse Replacement	11
Cleaning and Maintenance	12
Disposal and recycling Instructions	12
After Sales Support	12
Warranty Details	13

INTRODUCTION


Product Overview

The meter is a handheld 3 1/2 digital Multimeter for measuring DC and AC voltage, DC current, Resistance, Diode, Transistor and Continuity Test with battery operated systems.

Scope of Delivery

- 1 x SP62012 Multimeter, 1 x Black Test Lead, 1 x Red Test Lead & 1 x 9V Battery

Technical Specifications

Maximum voltage between terminals and earth ground	CAT II 600v
Fuse protection	F 200mA/250V
Power supply	9V battery
Display	LCD, 1999 counts, updates 2-3/ sec
Measuring method	Dual-Slope Integration A/D converter
Over range indication	Only figure "1" on the display
Polarity indication	"-" displayed for negative polarity
Operating environment	0°C to 50°C
Storage environment	-10°C to 50°C
Low battery indicator	"  " appears on display
Size	138mm x 69mm x 31mm
Weight	Approx. 170g

Features

1. Display

3 ½ digit, 7 segments, 15mm high LCD

2. Back Light (option)

When this button is pushed, the Back Light of the display is on. After about 5 seconds, the Back Light has an auto off function. Just push the button once to turn on again.

3. Rotary Switch

This switch is used to select functions and desired ranges as well as turn the meter on/off.

4. Hold Button

When this button is pushed, the display will keep the last reading and “H” symbol will appear on the LCD until pushing it again.

5. “10A” Jack

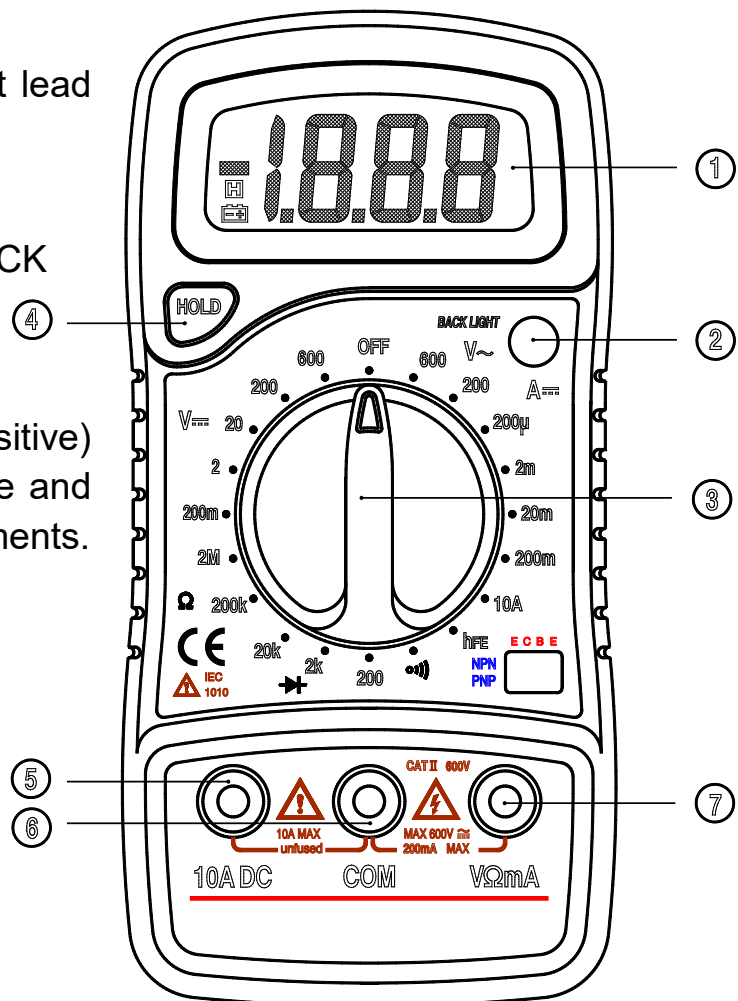
Plug in connector for RED test lead for 10A measurement

6. “COM” Jack

Plug in connector for BLACK (negative) test lead.

7. “VΩmA” Jack

Plug in connector for RED (positive) test lead for voltage, resistance and current (except 10A) measurements.



Intended Use

- Never exceed the protection limit values indicated in the specifications for each range of measurement.
- When the meter is linked to a measurement circuit, do not touch unused terminals.
- Never use the meter to measure voltages that might exceed 600v above earth ground in category II installations.
- When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
- Before rotating the range selector to change functions, disconnect test leads from the circuit under test.
- When carrying out measurements on TV's or switching power circuits always remember that there may be high amplitude voltage pulses at test points, which can damage the meter.
- Always be careful when working with voltages above 60V dc or 30Vac rms. Keep fingers behind the probe barriers while measuring.
- Before attempting to insert transistors for testing, always be sure that test leads have been disconnected from any measurement circuits. Components should not be connected to the hFE socket when making voltage measurements with test leads.
- Never perform resistance measurements on a live circuit.

Safety Information

This multimeter has been designed according to IEC-1010 concerning electronic measuring instruments with an over voltage category (CAT II) and pollution 2.

Follow all safety and operating instructions to ensure that the meter is used safely and is kept in a good condition.

Full compliance with safety standards can be guaranteed only with test leads supplied. If necessary, they must be replaced with the type specified in this manual.

Safety Symbols



Important safety information, refer to the operating manual.



Dangerous voltage may be present



Earth ground



Double insulation (Protection class II)



Fuse must be replaced with rating specified.

OPERATING INSTRUCTIONS

DC Voltage

Range	Resolution	Accuracy
200mV	100 μ V	$\pm 0.5\%$ of rdg ± 2 digits
2V	1mV	$\pm 0.5\%$ of rdg ± 2 digits
20V	10mV	$\pm 0.5\%$ of rdg ± 2 digits
200V	100mV	$\pm 0.5\%$ of rdg ± 2 digits
600V	1V	$\pm 0.8\%$ of rdg ± 2 digits

Overload Protection: 250V rms. For 200mV range and 600V dc or rms. Ac for other ranges

DC Current

Range	Resolution	Accuracy
200 μ A	0.1 μ A	$\pm 1\%$ of rdg ± 2 digits
2mA	1 μ A	$\pm 1\%$ of rdg ± 2 digits
20mA	10 μ A	$\pm 1\%$ of rdg ± 2 digits
200mA	100 μ A	$\pm 1.5\%$ of rdg ± 2 digits
10A	10mA	$\pm 3\%$ of rdg ± 2 digits


Overload Protection: F200mA/250Vfuse. (10A range unfused)


AC Voltage

Range	Resolution	Accuracy
200V	100mV	$\pm 1.2\%$ of rdg ± 10 digits
600V	1V	$\pm 1.2\%$ of rdg ± 10 digits

Overload Protection: 600V dc or rms. Ac for all ranges. Frequency range: 40Hz to 400Hz. Response: Average responding, calibrated in rms of a sine wave

Diode & Continuity

Range	Description
	If continuity exists (about less than 1.5k Ω), built-in buzzer will sound.

	Show the approx. forward voltage drop of the diode.
---	---

Overload Protection: 250Vdc or rms.ac.

Resistance

Range	Resolution	Accuracy
200 Ω	0.1 Ω	$\pm 0.8\%$ of rdg ± 3 digits
2k Ω	1 Ω	$\pm 0.8\%$ of rdg ± 2 digits
20k Ω	10 Ω	$\pm 0.8\%$ of rdg ± 2 digits
200k Ω	100 Ω	$\pm 0.8\%$ of rdg ± 2 digits
2M Ω	1k Ω	$\pm 1.0\%$ of rdg ± 2 digits

Maximum Open Circuit Voltage: 3.2V

Overload Protection: 250V dc or rms. Ac for all ranges.

Transistor hFE Test (0-1000)

Range	Test Range	Test Current	Test Voltage
NPN & PNP	0-1000	$I_b = 10\mu A$	$V_{ce} = 3V$

DC Voltage Measurement

1. Connect the red test lead to the V Ω mA jack and black test lead to the COM jack.
2. Set the rotary switch at desired DCV position. If the voltage to be measured is not known beforehand, set the range switch at the highest range position and then reduce it until satisfactory resolution is obtained.
3. Connect test leads across the source or load being measured.
4. Read the voltage value on the LCD display along with the polarity of the red lead connection

DC Current Measurement

1. For measurements between 200mA and 10A, put the red test lead in the 10A jack
2. Set the rotary switch at the desired DCA position.
3. Open the circuit in which the current is to be measured, and connect the test leads in series with the circuit.
4. Read the current value on the LCD display along with the polarity of red lead connection.

Ac Voltage Measurement

1. Connect the red test lead to the $V\Omega mA$ jack, and the black test lead to the COM jack.
2. Set the rotary switch to the desired AVC position.
3. Connect the test leads across the source or load being measured.
4. Read the voltage value on the LCD screen.

Resistance Measurement

1. Connect the red test lead to the $V\Omega mA$ jack and the black test lead to the COM jack. (The polarity of the red lead is positive "+".)
2. Set the rotary switch to the desired Ω range position.
3. Connect the test leads across the resistor to be measured and read the LCD display.
4. If the resistance being measured is connected to a circuit, turn off power and disconnect all capacitors before applying test probes.

Diode Test

1. Connect the red test lead to the $V\Omega mA$ jack and the black test lead to the COM jack. (The polarity of the red lead is positive "+".)
2. Set the rotary switch to the " $\rightarrow +$ " position.
3. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode of the diode.
4. The approx. forward voltage drop of the diode will be displayed. If the connection is reversed, only figure "1" will be shown.

Transistor Test

1. Set the rotary switch to the "hFE" position.
2. Determine whether the transistor under testing is NPN or PNP and locate the emitter, base and collector leads. Insert then leads into the proper holes of the hFE socket on the front of the panel.
3. Read the approximate hFE value at the test condition of base current $10\mu\text{A}$ and V_{ce} 3V.


Attention

To avoid electrical shock, remove the test leads from measurement circuits before testing a transistor.

Audible Continuity Test

1. Connect the red test lead to the $V\Omega\text{mA}$ jack and the black test lead to the COM jack.
2. Set the range switch to the " " position.
3. Connect the test leads to two points of the circuit to be tested. If continuity exists, the built-in buzzer will sound.

Battery & Fuse Replacement

If the battery symbol '  ' appears on the display, it indicates that the battery should be replaced.

The fuse rarely needs replacement. A blown fuse is almost always operator error.

To replace battery and fuse, remove the two screws on the back of the case. Simply remove the old one and replace with a new one.

Be careful to observe battery polarity.

Warning

Before attempting to open the case, always be sure that the test leads have been disconnected from measurement circuits. Close the case and tighten screws completely before using the meter to avoid electric shock.

Cleaning & Maintenance

- Before opening the case, always disconnect test leads from all energized circuits
- For protection against fire, replace fuse only with the specified voltage and current ratings (F 200mA/250V quick acting)
- Never use the meter unless the back cover is in place and fastened completely.
- Do not use abrasives or solvents on the meter. To clean, use a damp cloth and mild detergent only.

Disposal & Recycling Information

When the tool reaches its end of life, take it to a collection point designated by local authorities for E-waste.

The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

AFTER SALES SUPPORT



service@austechindustries.com.au



1300 730 056



LIMITED WARRANTY

This Limited Warranty applies only to new products* distributed by SP Tools Pty Ltd ("SP Tools"). It is a condition of this Limited Warranty Policy that the purchaser read the owner's manual for the product and only use the product to the extent or for the purposes stated therein. The purchaser must also ensure that all servicing requirements are completed as listed in the owner's manual (said servicing is at the owner's expense). We recommend that all servicing is completed by an authorised service agent and that records of said servicing are retained by the purchaser as proof in the event of a warranty claim.

Whilst the owner's manual, packaging, and/or other documentation supplied with SP Tools' products may provide details in respect of a Limited Warranty, the terms set out herein supersede these matters, and this Limited Warranty applies in their place. This warranty is no less advantageous than otherwise described in such other documentation.

SP Tools agrees, subject to the terms and conditions specified below, to repair or replace at SP Tools' cost, the product purchased by you when the product does not perform in accordance with its specifications during the limited warranty period, due to any fault in manufacturing, materials and/or workmanship. SP Tools is not liable to repair or replace products that the purchaser uses in a manner that is inconsistent with the owner's manual or in the circumstances set out in paragraphs 1.1 – 1.7 below.

The benefits to the purchaser under this warranty are in addition to other rights and remedies under the *Competition and Consumer Act 2010* (Cth). The limited warranty period, within which a defect in the product must appear, commences from the date of purchase and ceases on expiration of the specified term below.

THE LIMITED WARRANTY PERIOD

- SP Speciality Tools – 12 Months



THE PURCHASERS ATTENTION IS DRAWN TO THE FOLLOWING

To the extent permitted by law and subject to this Limited Warranty, and as part of the terms of the sale of the equipment or part thereof: SP Tools shall not be liable for any form of loss, damage, cost, injury or harm of any kind (whether direct, indirect, special or consequential) howsoever arising from the use or supply of the equipment to the purchaser.

EXCLUSIONS TO LIMITED WARRANTY POLICY

This Limited Warranty will not apply where the equipment or any part thereof:

- 1.1 Fails due to an accident (including liquid spillage), abuse, misuse, neglect or normal wear and tear;
- 1.2 Has been used in a manner other than for which it was originally designed;
- 1.3 Has been tampered with or is otherwise than as supplied by SP Tools;
- 1.4 Where any damage, malfunction or other failure of the equipment or any part thereof resulted directly or indirectly from unauthorized persons, adjusting or failing to adjust any part requiring normal maintenance and service (examples include adjustment of tappets, air filter maintenance, lubrication and tightening of screws nuts and bolts);
- 1.5 Malfunctions due to the use of defective or incompatible accessories;
- 1.6 Is damaged by lightning or thunderstorm activity; or
- 1.7 Has been transported to a country where no authorised Service Agents exist.

CLAIMING WARRANTY

This Limited Warranty may be claimed on in the following manner:

- 2.1 In order to make a claim under this Limited Warranty, the purchaser must deliver the equipment or any part thereof to an SP Tools authorised repair agent and pay all costs of transportation and all costs incidental to making a claim under this Limited Warranty. The purchaser must first contact SP Tools (contact details described above) and request the delivery address of an SP Tools authorised repair agent.
- 2.2 The purchaser must deliver to the repair agent written reasons why the purchaser considers that the purchaser has a claim under this Limited Warranty and must provide all necessary details, including:
 - The place, date and from whom the unit or part was purchased.
 - The unit or part involved, Model and Serial Number.
 - The defect, malfunction or failure in respect of which the claim is being made.
 - Proof of service of the unit or part (if applicable)
 - Proof of purchase in respect of the unit or part.
- 2.3 If the Limited Warranty claim is valid, the repair agent will carry out repairs and return the product at no charge to the purchaser. These repairs are limited to the Limited Warranty fault identified and as such will not include any other faults due to misuse, abuse, failure to maintain, fair wear and tear or the replacement of serviceable items such as oil, spark plugs, air filters, fuel etc.

Our goods come with guarantees that cannot be excluded under Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Note: Units which are failing to perform in accordance with specifications due to non-warrantable causes will be subject to freight, repair and or quote charge