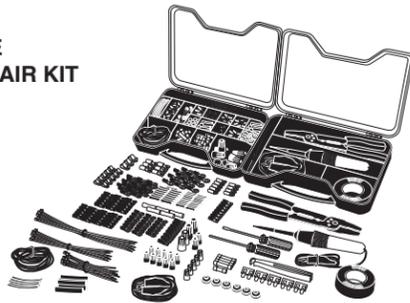


Also from Performance Tool:

285 pc MULTI-USE ELECTRICAL REPAIR KIT W5207



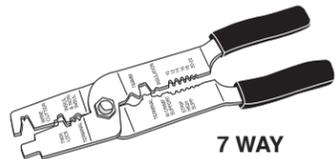
POCKET MULTI-TESTER W2979C



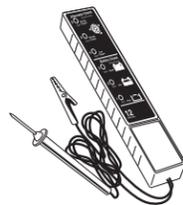
12 Volt CIRCUIT TESTER W2975C



7 WAY CRIMPING TOOL W86500



BATTERY & ALTERNATOR VOLTAGE TESTER W2980

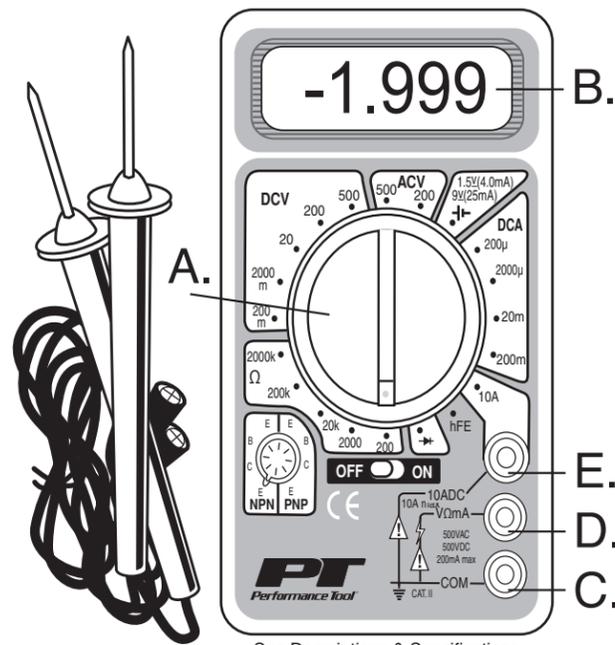


Always wear eye protection when using tools.
Performance Tool part number W1024

Digital Multi-Tester

Stock Number W2974

OWNER'S MANUAL



See Descriptions & Specifications for explanations of notations.



FOR YOUR SAFETY, please read these instructions carefully and retain them for future use.

Performance Tool

DESCRIPTION & SPECIFICATIONS

The Performance Tool Digital Multi-tester (#W2970) is a quality, professional tool which will measure DC and AC voltage, DC current, resistance and performing transistor and diode test. Overload protection and low battery indication are provided. This meter is ideal for use in fields, such as laboratories, workshops and hobby applications.

Explanation of cover illustration notations:

- A.) Function & Range Switch - This switch is used to select functions and desired ranges as well as to turn the meter on and off. To extend the life of the battery, this switch should be set at in the "off" position when not in use.
- B.) Display - 3-1/2 digit, 7 segment, .5" high LCD display.
- C.) "Common" Jack - Plug in connector for black (negative) test lead.
- D.) "V Ω mA" Jack - Plug in connector for red (positive) test lead for all voltage, resistance and current (except 10A) measurements.
- E.) "10A" Jack - Plug in connector for red (positive) test lead for 10A measurement. Accuracy is guaranteed for 1 year, 23° C ± 5° C, less than 75% RH.

DC Voltage:

Range	Resolution	Accuracy
200mV	0.1mV	±0.5% of rdg ± 2D
2000mV	1mV	±0.5% of rdg ± 2D
20V	10mV	±0.5% of rdg ± 2D
200V	0.1V	±0.5% of rdg ± 2D
500V	1V	±0.8% of rdg ± 2D

Overload protection: 220V rms AC for 200mV range and 500V DC or 500V rms AC for other ranges.

AC Voltage:

Range	Resolution	Accuracy
200V	0.1V	±1.2% of rdg ± 10D
500V	1V	±1.2% of rdg ± 10D

Overload protection: 500V DC for 500V rms AC for all ranges.
Response: Average responding, calibrated in rms of a sine wave.
Frequency Range: 45Hz to 450Hz

DESCRIPTION & SPECIFICATIONS cont.

DC Current:

Range	Resolution	Accuracy
200μA	0.1μA	±1.2% of rdg ± 2D
2000μA	1μA	±1.2% of rdg ± 2D
20mA	0.01mA	±1.2% of rdg ± 2D
200mA	0.1mA	±1.5% of rdg ± 2D
10A	10mA	±3.0% of rdg ± 2D

Overload protection: 250mA/250V fuse (10A range unfused).

Resistance:

Range	Resolution	Accuracy
200ohm	0.1ohm	±0.8% of rdg ± 10D
2000ohm	1ohm	±0.8% of rdg ± 10D
20kohm	10ohm	±0.8% of rdg ± 10D
200kohm	100ohm	±0.8% of rdg ± 10D
2000kohm	1kohm	±1.0% of rdg ± 10D

Maximum open circuit voltage: 3.2V
Overload protection: 250V rms AC on all ranges

General Characteristics

Maximum display: 1999 counts with automatic polarity indication.
Measuring method: Dual-slope integration A-D conversion
Over range indication: "1" figure only in the display
Maximum common mode voltage: 500V DC/rms AC
Temperature ranges: Operating 32°F to 104°F, less than 80% RH
Storage 14°F to 122°F

Power supply: 9V battery, NEDA 1604, 6F22 type or equivalent
Dimensions: 126 x 70 x 25mm
Weight: Approximately 170G

OPERATING INSTRUCTIONS

DC Voltage Measurement:

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

AC Voltage Measurement:

1. Connect the red test lead to "V Ω mA" jack and the black test lead to "COM" jack.
2. Set range switch to desired ACV range position.
3. Connect test probes to device or load being measured.
4. Read voltage value on the LCD display.

DC Current Measurement:

1. Connect the red test lead to "V Ω mA" jack and the black test lead to "COM" jack. (For measurements between 200mA and 10A, connect red lead to "10A" jack.)
2. Set range switch to desired DCA range position.
3. Open the circuit in which the current is to be measured, and connect test probes in series with the circuit.
4. Read current value on the LCD display along with the polarity of red lead connection.

Resistance Measurement:

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

OPERATING INSTRUCTIONS cont.

Transistor Test:

1. Set range switch at "hFE" position.
2. Determine whether the transistor under testing is NPN or PNP type and locate the emitter, base, and collector leads. Insert these leads into proper holes of the "hFE" test socket on the front panel.
3. The meter will show the approximate hFE value at the condition of base current 10μA and Vce 3.0V.

Diode Test:

1. Connect the red test lead to "V Ω mA" jack and the black test lead to "COM" jack.
2. Set range switch at ->+ position.
3. Connect red probe to the anode of the diode to be tested and black probe to the cathode of the diode.
4. The approximate forward voltage drop of the diode will be displayed in mV. If connection is reversed, only figure "1" will be shown.

BATTERY & FUSE REPLACEMENT

If the sign "BAT" appears on the LCD display, it indicates that the battery should be replaced. Remove screws on the back cover and open the case. Replace the exhausted battery with a new one of the same type: 9V NEDA 1604, 6F22 or 006P. Fuse rarely need replacement and blow almost always as a result of operator's error. Open the case as mentioned above and replace the blown fuse with the ratings of F 250mA/250V.



WARNINGS

Before attempting to open the case, be sure that test leads have been disconnected from measurement circuits to avoid shock hazard.

For protection against fire, replace fuse only with the specified ratings.

Failure to adhere to warnings can result in serious or fatal injuries and/or property damage.

CARE & MAINTENANCE

Please follow all safety and operating instructions to ensure this meter is used safely and is kept in good condition.

Full compliance with safety standards can be guaranteed only with test leads supplied.

If necessary, test leads must be replaced with the same electric ratings:

1000V, 10A. Always keep measuring leads in good condition.

Never exceed the protection limit values indicated in the specifications for each range of measurement. Never use meter to measure voltages that might exceed 500V above earth ground.

Always be careful when working with voltages above 60V dc or 30V ac rms.

When the meter is linked to measurement circuit, do not touch unused terminals.

Keep fingers behind the probe barriers while measuring.

Do not perform resistance measurements on live circuits.

SAFETY SYMBOLS:



Important safety information, refer to manual



Dangerous voltage may be present



Earth ground



Complies with requirements for double insulation



Indicates that the fuse must be replaced with one having the ratings indicated

Before opening the case, always disconnect test leads from all energized circuits.

For continued protection against fire, replace fuse only with the specified voltage and current ratings: F 250mA/250V (quick acting).

Never use the meter unless the back cover is in place and fully fastened.

Do not use abrasives or solvents on the meter, use only a damp cloth and mild detergent to clean the meter.

WARRANTY INFORMATION

LIMITED WARRANTY

PERFORMANCE TOOL extends only the following warranties, and only to original retail purchasers. These warranties give specific legal rights. Except where prohibited by local law, the law of the State of Washington governs all warranties and all exclusions and limitations of warranties and remedies. There may be other rights which vary from state to state.

PERFORMANCE TOOL warrants the product to be free from defects in materials and workmanship under normal use and service. A defective product may be returned for a free replacement within 90 days from the date of purchase, provided that product is returned to place of purchase immediately after discovery of defect. After 90 days and up to 1 year from date of purchase, PERFORMANCE TOOL will replace at no charge any parts which our examination shall disclose to be defective and under warranty.

These warranties shall be valid only when a sales receipt showing the date of purchase accompanies the defective product or defective part(s) being returned. For part(s) after 90 days, please remit your request, postage prepaid to: PERFORMANCE TOOL, P.O. Box 88259 Tukwila, WA 98188

These warranties exclude blades, bits, punches, dies, bulbs, fuses, batteries and other consumables which must be replaced under normal use and service. These warranties shall not apply to any product or part which is used for a purpose for which it is not designed, or which has been repaired or altered in any way so as to affect adversely its performance or reliability, nor shall these warranties apply to any product or part which has been subject to misuse, neglect, accident or wear and tear incident to normal use and service.

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