# APPA 67 Digital Multimeter Instruction Manual



Contents



## APPA 67 Digital Multimeter


**Product Information**
The APPA 67 is a digital multimeter designed for measuring various electrical parameters. It comes with a digital display, rotary switch for function and range selection, and multiple input terminals for different types of measurements. The meter is compact in size and includes a holster for easy carrying.

**Front Panel Features**

- **Digital Display:** The 3200 counts LCD readout with a 65-segment analog bar graph shows measurement values. It also includes various annunciators for functions like auto polarity, decimal point, DC, AC, range, and unit.
- **Rotary Switch:** This switch is used to select the desired function and range.
- **Input Terminals:** The COM input terminal is for the ground connection, while the V input terminal is used for positive input connections related to volts, ohms, and diode measurements.
- **Reset Switch:** This switch can be used to turn the meter back on.
- **Hold Switch:** When pressed, this switch holds the measured values for all functions.

**Specifications**

- **General Specifications:** The meter dimensions are 85mm x 165mm x 40mm (with holster). It weighs 250gms without the holster and 370gms with the holster. The package includes test leads, a battery (installed), an operator’s manual, and a holster.
- **Environmental Conditions:** The meter is suitable for indoor use and can be used up to a maximum altitude of 2000m. It complies with IEC 61010 standards and has a CAT II rating for 600V.

## Product Usage Instructions

To use the APPA 67 digital multimeter, follow these steps:

1. Unpack the meter and ensure that you have all the included items: the digital multimeter, test lead set (one black, one red), operator’s manual, and holster.
2. Familiarize yourself with the front panel controls and connectors. The digital display shows measurement

values, the rotary switch is used for function and range selection, and the input terminals are used for different types of measurements.

3. For voltage, ohm, and diode measurements, connect the positive lead to the V input terminal and the negative lead to the COM input terminal.
4. Use the rotary switch to select the desired function and range.
   The digital display will show the measurement value.
5. If you want to hold the measured value, press the Hold switch.
   To release the hold, press the switch again.
6. If the meter is turned off, you can turn it back on by pressing the Reset switch.
7. When measuring AC or DC current, use the appropriate input terminal and select the current mode on the rotary switch. Follow the instructions in the manual for specific current measurement procedures.
8. Ensure that you are within the specified environmental conditions for accurate measurements.

DIGITAL MULTIMETER
INSTRUCTION MANUAL
APPA 67

## INTRODUCTION

Unpacking and Inspection

Upon removing your new Digital Multimeter from its packing, you should have the following items:

1. Digital Multimeter.
2. Test lead set (one black, one red).
3. Operators Manual.
4. Holster.

### Meter Safety

Terms as Marked on Equipment

- ATTENTION — Refer to Manual.
- DOUBLE INSULATION — Protection Class II.
- DANGER — Risk of electric shock.

### Symbols in this Manual

⚠ This symbol indicates where cautionary or other information is found in the manual.

⎓ Fuse

⏤
Battery

### Front Panel

Refer to Figure 1 and the following numbered steps to familiarize yourself with the meter’s front panel controls and

connectors.

1. Digital Display — The digital display has a 3200 counts LCD readout with 65 segments analog bar graph, auto polarity, decimal point, +, ☼, DC⎓, AC ∿, ⏚, RANGE, and Unit annunciators.
2. Rotary Switch — Selects the desired function and range.
3. COM Input Terminal — Ground input connector.
4. VΩ ⏚ Input Terminal — Positive input connector for Volts, Ohms and Diode measurements.
5. μA mA Input Terminal — Positive input connector for current and measurements. (up to 300mA).
6. A Input Terminal — Positive input connector for current measurements, up to 10A.
7. Function Switch (Blue) — Press the switch to measure AC voltage or DC voltage in the Voltage mode or to measure AC current or DC current in the current mode, or to measure continuity or diode check in •)) / ⏚ mode.
8. Reset Switch – The meter can be turned back on by pushing “RESET” key switch.
9. Hold Switch – This switch is used to hold measured values for all functions. When pressed the “ ☼ ” annunciator is displayed. Conversions are made but the display is not updated.
10. Range Switch (Manual Range) – The “Range” switch is pressed to select manual ranging and to change ranges. When the “Range” switch is pressed once, the “RANGE” annunciator on the LCD disappears. Press the “Range” switch to select the appropriate range to be used. Press the “Range” switch and hold for 2 seconds to return to Auto-ranging.

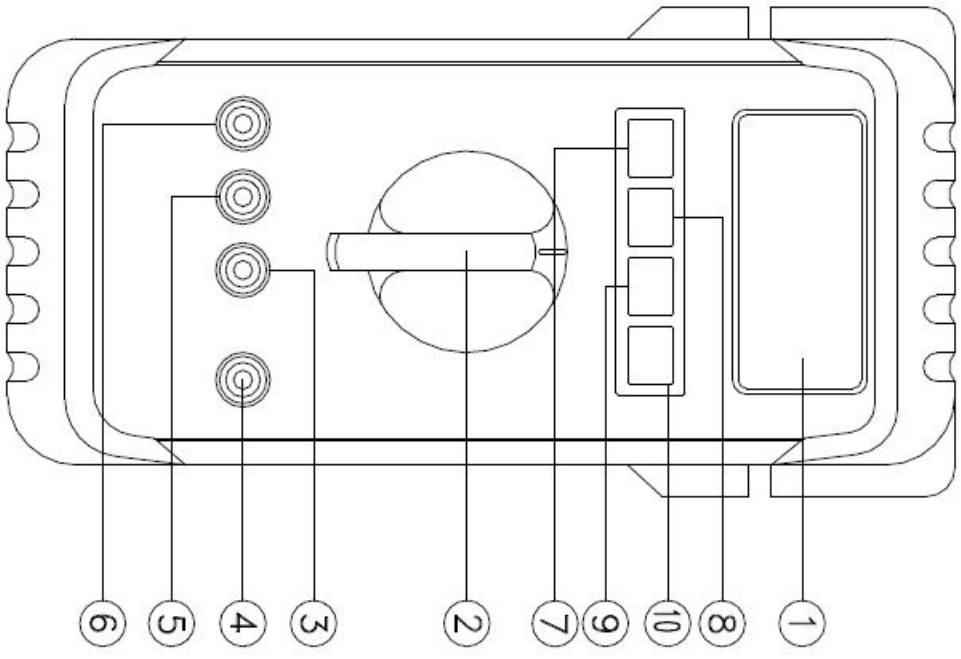



Figure 1

## SPECIFICATIONS

### General Specifications

- Display: The Liquid Crystal Display (LCD) has a maximum reading of 3200, and 65 segments bar graph.
- Polarity Indication: Automatic, positive implied, negative indicated.
- Overrange Indication: “OL” or “-OL”.

- Low Battery Indication: "⊣" is displayed when the battery voltage drops below operating voltage.
- Sampling: 2 times/sec for digit. 12 times/sec for analog bargraph.
- Auto Power Off Approximately 10 minutes unless the measured value changes within this time.
- Temperature Coefficient : 0.15 x (Specified accuracy) / °C, < 18°C or > 28°C.
- Power Requirements: IEC LR03, AM4 or AAA size 1.5V x 2.
- Battery Life: Alkaline 900 hours.
- Dimensions (HxWxD): 66mm x 155mm x 34mm, without holster.
- 85mm x 165mm x 40mm, with holster.
- Weight (including battery): 250 gms,without holster.
  370 gms, with holster.
- Supplied Accessories: Test leads, battery (installed), operator's manual and holster.

#### Environmental Conditions

**For indoor use.**

- Maximum Altitude : 2000m.
- Pollution Degree : 2
- Operating Ambient : 0°C to 50°C, 0 to 80% R.H.
- Storage Temperature: -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.
- Installation Category: IEC 61010, 600V CAT II.

CAT Application field

| | |
|---|---|
| **I** | The circuits not connected to mains. |
| **II** | The circuits directly connected to Low-voltage installation. |
| **III** | The building installation. |
| **IV** | The source of the Low-voltage installation. |

**Electrical Specifications**
Accuracy is ± (% reading + number of digits) at 23C ± 5C less than 80% R.H.

**DC Volts**

| Range | Resolution | Accuracy | Over voltage protection |
|---|---|---|---|
| 300mV | 100µV | ±(0.7%reading + 2digits) | 600Vd.c. or 600Va.c.rms |
| 3V | 1mV | | |
| 30V | 10mV | | |
| 300V | 100mV | | |
| 600V | 1V | | |

Input Impedance : 10MΩ.

**AC Volts**

| Range | Resolution | Accuracy | Over voltage protection |
|---|---|---|---|
| 3V | 1mV | ±(1.7%reading + 5digits) | 600Vd.c. or 600Va.c.rms |
| 30V | 10mV | ±(1.7%reading + 5digits) 40Hz to 400Hz | |
| 300V | 100mV | | |
| 600V | 1V | | |

- Frequency Response : 40Hz ~ 300Hz for 3V Range.
- AC Conversion Type : Average Sensing rms indication.
- Input Impedance : 10MΩ //less than 100PF.

**DC Current**

| Range | Resolution | Accuracy | Voltage Burden |
|---|---|---|---|
| 300µA | 0.1µA | ±(1.2%reading + 2digitst) | 200mV max |
| 3mA | 1µA | | 2V max |
| 30mA | 10µA | | 200mV max |
| 300mA | 0.1mA | | 2V max |
| 20A | 10mA | ±(2.5%reading + 5digits) | 2V max |

20A Range : 30 seconds maximum above 10A input.

**Overload Protection :** 1A/240V fast for µA/mA input.
13A/240V fast for A input.

**AC Current**

| Range | Resolution | Accuracy | Voltage Burden |
|---|---|---|---|
| 300µA | 0.1µA | ±(1.7%reading + 4digits) | 200mV max |
| 3mA | 1µA | | 2V max |
| 30mA | 10µA | | 200mV max |
| 300mA | 0.1mA | ±(2.0%reading + 4digits) | 2V max |
| 20A | 10mA | ±(2.9%reading + 7digits) | 2V max |

Frequency Response : 40Hz ~ 500Hz.
* 20A Range : 30 seconds maximum above 10A input.
Overload Protection : 1A/240V fast for µA/mA input.

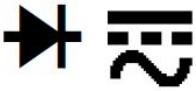
13A/240V fast for A input.
AC Conversion Type : Average sensing rms indication.

**Resistance**

| Range | Resolution | Accuracy | Voltage Burden |
|---|---|---|---|
| 300Ω | 0.1Ω | ±(1.2%reading + 4digits) | 600Vd.c. or 600Va.c. rms |
| 3KΩ | 1Ω | ±(0.9%reading + 2digits) | |
| 30KΩ | 10Ω | | |
| 300KΩ | 100Ω | | |
| 3MΩ | 1KΩ | ±(1.2%reading + 3digits) | |
| * 30MΩ | 10KΩ | ±(2.5%reading + 5digits) | |

Open Circuit Voltage : 1.3V approx.

**Diode Check and Continuity**

| Range | Resolution | Accuracy | Max. Test Current | Max. Open Circuit Voltage |
|---|---|---|---|---|
|  | 1mV | ±(1.5%reading + 5digits ) | 1.5mA | 3.3V |

*For 0.4V ~ 0.8V.
Overload Protection: 600V DC/AC rms max.
Continuity: Built-in sounder will operate when resistance is less than 30Ω.

**Auto Power Off**
The meter will automatically shut itself off approximately 10 minutes after power on unless the value being measured changes within this time. The meter can be turned back on by pressing “Reset” key switch.

**Beep Guard**
The beeper will sound if the test lead is connected to the μA/mA/(A) input terminal, but the rotary function selector is not in the μA/mA/(A) positions.

## OPERATION

This instrument has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electronic Measuring Apparatus and has been supplied in a safe condition. This instruction manual contains some information and warnings which must be followed by the user to ensure safe operation and to retain the instrument in safe condition.

**Preparation and Caution before Measurement**

1. Before measurement, warm up for at least 30 seconds.
2. When the rotary function selector is changed during measurement, be sure to do so only after removing the

test leads from the equipment.

3. If the equipment is used near noise generating equipment, be aware that the display may become unstable or indicate large errors.
4. Maximum rated voltage to earth for voltage and current measurements terminals is 600V AC/DC CAT II.

**Voltage Measurements**

1. Connect the red test lead to the "VΩ  " input terminal and the black test lead to the "COM" terminal.
2. Set the rotary function switch to the ACV or DCV position.
3. Connect the test leads to the device to be measured.
4. When the input is over-ranged the most significant digit of LCD display flashes and the three last significant digits are set to zero.
5. " Warning : Do not exceed 600Vd.c. or 600Va.c. limits stated in the specification".

**WARNING**
TO AVOID ELECTRIC SHOCK HAZARD, OR DAMAGE TO THE METER, DO NOT ATTEMPT TO MEASURE VOLTAGES THAT MIGHT EXCEED 600 VOLTS d.c. OR 600 VOLTS a.c.. DO NOT APPLY MORE THAN 600V d.c. OR 600V a.c. RMS BETWEEN THE COMMON INPUT TERMINAL AND EARTH GROUND.

**Resistance Measurement**

1. Connect the red test lead to the "VΩ  " terminal and the black test lead to the "COM" terminal.
2. Set the rotary function switch to the "Ω" position to measure resistance.
3. For correct reading, ensure that there is no voltage present across the device being tested.
4. Connect the test leads across the resistor to be measured. To ensure the best accuracy in measurement of low resistance, short the test leads before measurement and note the test lead resistance. It is necessary to subtract the resistance of the test leads from the displayed reading.

**Continuity Check by Sounder**

1. Connect the red test lead to the "VΩ  " terminal and the black test lead to the "COM" terminal.
2. Set the rotary function switch to "  " position.
3. Connect the test leads to the circuit to be measured. The sounder will operate if the resistance of the circuit measured is lower than 30Ω.
4. The sounder may operate when the instrument is first switched on in the continuity mode and all the LCD segments are displayed.

**Diode Check**

1. Set the rotary switch to the "  " position.
2. Connect the black test lead to the "COM" terminal and the red lead to the "VΩ  " input terminal.

3. Connect the test leads to the diode. Normally the forward drop of good silicon diode is shown between 0.4V to 0.9V. If the diode under test is defective, “000” (short circuit) or “OL” (non-conductance) is displayed.
   Reverse Check of Diode : If the diode under test is good “1” is displayed. If the diode under test is defective “000” or other values will be displayed.

**Current Measurement**

1. Connect the red test lead to “μA/mA” terminal and the black test lead to “COM” terminal or use the “A” and “COM” terminal in the “A” range.
2. Set the function selector rotary switch to “μA” or “mA” or “A”.
3. Measurement of AC current can be performed by pressing the “AC/DC” switch.
4. Connect the test leads to the circuit to be measured.

## MAINTENANCE

**WARNING** : TO AVOID ELECTRICAL SHOCK REMOVE TEST LEAD BEFORE OPENING THE COVER.

**General Maintenance**
To keep the instrument clean, wipe the case with a dry cloth and detergent, do not use abrasives or solvents. Any adjustment, maintenance and repair of the opened instrument under voltage shall be avoided as far as possible and, if inevitable, shall be carried out by a skilled person who is aware of the hazard involved. Whenever it is likely that the protection has been impaired, the instrument shall be made inoperative and be secured against any unintended operation.

The protection is likely to be impaired if, for example, the apparatus:

- shows visible damage,
- fails to perform the intended measurements,
- has been subjected to prolonged storage under unfavorable conditions,
- has been subjected to severe transport stresses.

**BATTERY INSTALLATION OR REPLACEMENT**

The meter is powered by two 1.5V batteries. Refer to Figure 2A and use the following procedure to replace the batteries:

1. Disconnect the test leads and turn the meter off. Remove the test leads from the front terminals.
2. Remove the holster.
3. Position the meter face down. Remove the screw from the case bottom.
4. Lift the end of the case bottom until it gently unsnaps from the case top at the end nearest the LCD.
5. Lift the battery from case top, and carefully disconnect the batteries from battery connector leads.
6. Snap the battery connector leads to the terminals of the new batteries and reinsert the batteries into the case top.
   Make sure that the battery leads to not become pinched between the case bottom and case top.
7. Replace the case bottom. Reinstall the screw and replace the holster.

**FUSE REPLACEMENT**

Refer to Figure 2B and use the following procedure to examine or replace the meter's fuse:

1. Perform steps 1 through 4 of the battery replacement procedure.
2. Lift the circuit board from case top. Do not remove the screws from the circuit board.
3. Remove the defective fuse by gently prying one end of the fuse loose and sliding the fuse out of the fuse holder.
4. Install a new fuse of the same size and rating. Make sure the new fuse is fitted centrally in the fuse holder.
5. Make sure that the case top rotary switch and circuit board switch both are in the OFF position.
6. Replace the case top and case bottom. Make sure that the battery leads do not become pinched between the case halves. Reinstall the screw.

## BATTERY REPLACEMENT

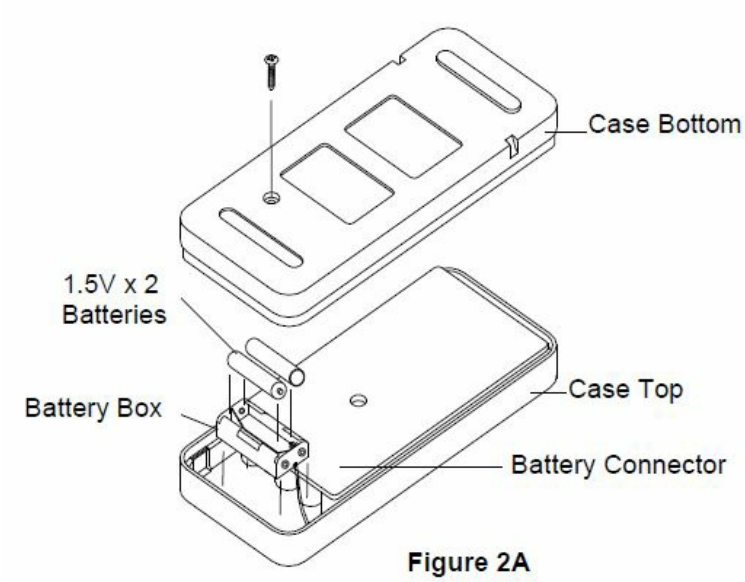



Figure 2A

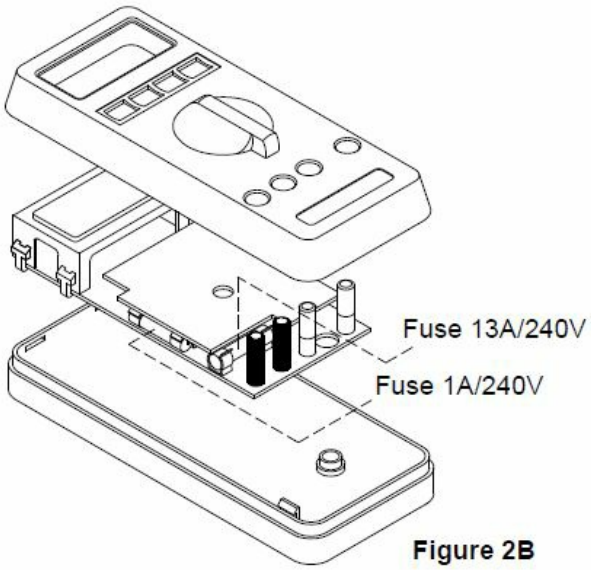
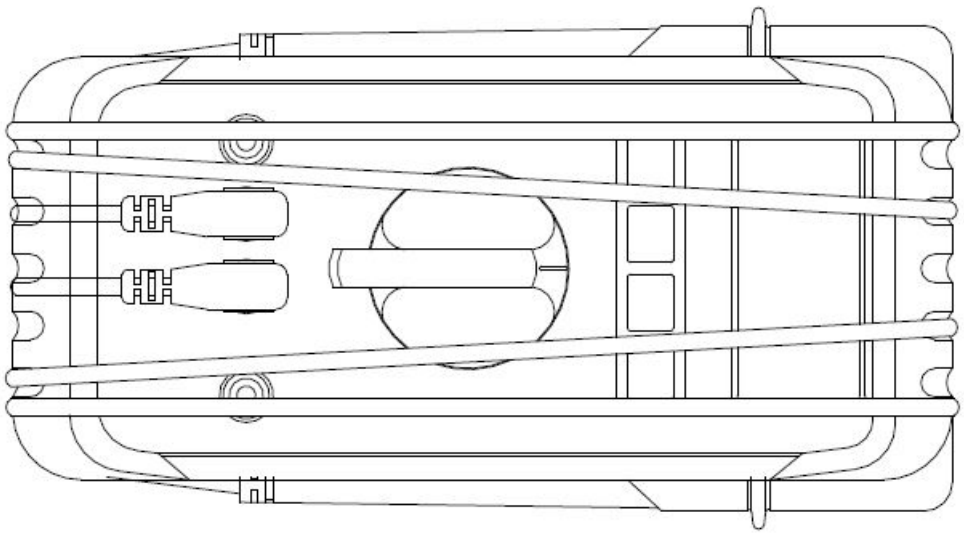


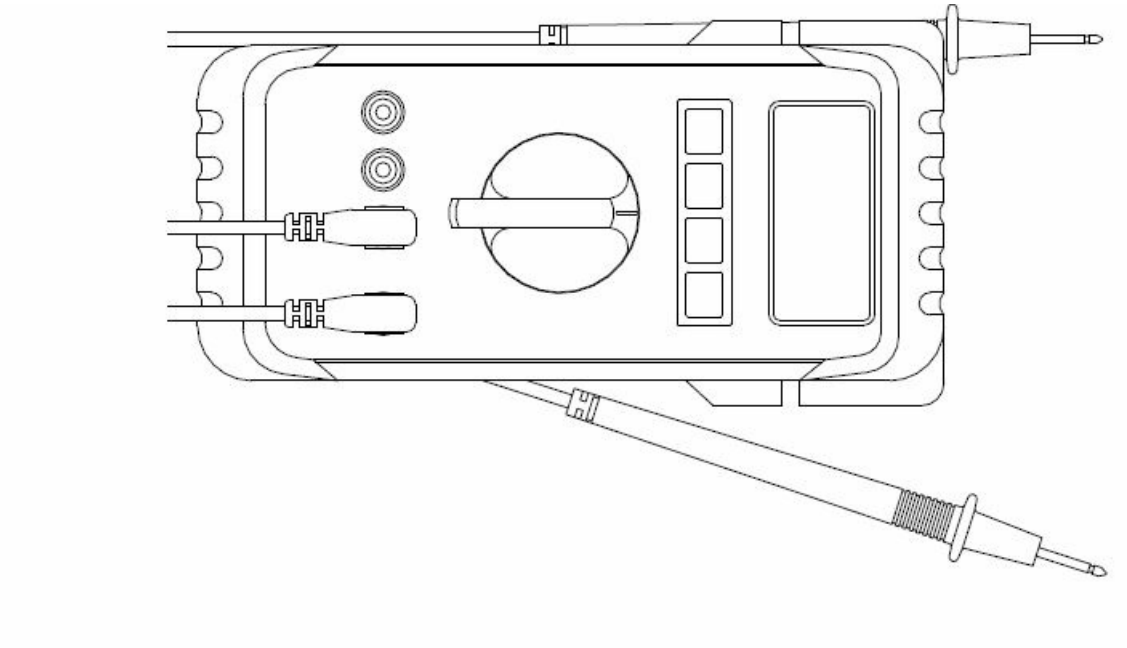

Figure 2B

**HOW TO USE THE PROBE HOLDER**



Wrap the leads around the holster to store the test probes.

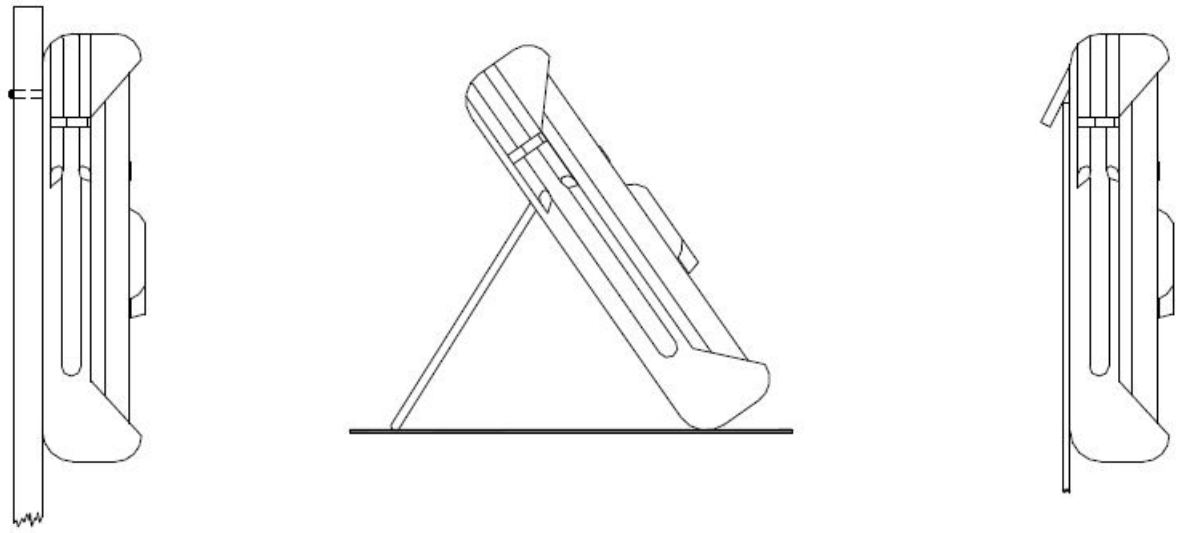
**HOW TO USE THE PROBE HOLDER**



Slide out one probe holder for one handed meter operation.

**HOW TO USE THE TILT STAND AND HOLSTER**

- Hang on a nail at the workbench.
- Swing the stand out for easier meter reading.
- Swing the upper holder out and hook it over a door.



**APPA TECHNOLOGY CORP.**
9F.119-1 Pao-Zong Rd., Shin-Tien,
Taipai, 23115, Taiwan, R.O.C.
P.O.Box. 12-24 Shin-Tien, Taiwan.
Tel : 886-2-29178820 Fax : 886-2-29170848
e-mail: **info@appatech.com**
**http://www.appatech.com**

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## Documents / Resources

| | |
|---|---|
|  | APPA 67 Digital Multimeter [pdf] Instruction Manual<br>67 Digital Multimeter, 67, Digital Multimeter, Multimeter |

## References

- APPA