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Excelvan M6013

Excelvan M6013 Digital Auto Ranging Capacitance Meter

User Manual

1. Introduction

Thank you for choosing the Excelvan M6013 Digital Auto Ranging Capacitance Meter. This device is designed for precise measurement of capacitance values, ranging from 0.01pF to 470mF (470,000uF). It features a 5-digit display, auto-ranging capabilities, and options for both battery and external USB power. This manual provides essential information for safe and effective use of your capacitance meter.

2. Safety Information

Please read and understand all safety instructions before operating the device. Failure to follow these instructions may result in electric shock, fire, or damage to the meter or the item being tested.

- **Discharge Capacitors:** Always ensure that any capacitor to be tested is fully discharged before connecting it to the meter. Charged capacitors can cause damage to the meter and pose a shock hazard.
- **Inspect Leads:** Before each use, inspect test leads for any damage to the insulation or connectors. Do not use damaged leads.
- **Operating Environment:** Use the meter in a dry environment. Avoid operating in areas with high humidity, extreme temperatures, or explosive gases.
- **Proper Use:** Do not attempt to measure capacitance of circuits that are powered. The meter is designed for testing discrete components.

3. Product Overview

3.1 Features

- Wide Measurement Range: 0.01pF to 470mF (470,000uF).
- High Resolution: 5-digit display for precise readings.
- Fast Measurement: Reads 2200uF in approximately 0.2 seconds.
- Stable Readings: Auto-running averaging function for stable and accurate pF measurements.
- Display: 128 x 64 dot matrix LCD.
- Power Options: Operates on 2x AA 1.5V batteries or external 5V micro USB power.

3.2 Components



Figure 1: Front view of the Excelvan M6013 Capacitance Meter with test leads connected, showing a reading of 1.02 pF. The display shows 'SMALL CAPACITOR:' and 'FREQUENCY: 515890 HZ'. Buttons for Power, Zero, and Mode/Range are visible below the screen.



Figure 2: Front view of the Excelvan M6013 Capacitance Meter with the LCD screen off. The power button (red circle), zero button (white square), and mode/range button (white square) are clearly visible. Input jacks for test leads are located at the bottom.



Figure 3: Rear view of the Excelvan M6013 Capacitance Meter, showing the integrated kickstand for propping the device up on a surface. The battery compartment is located behind this stand.

The meter features a clear LCD display, three control buttons (Power, Zero, Mode/Range), and input jacks for test leads on the front. The rear of the unit includes a foldable kickstand and the battery compartment.

4. Setup

4.1 Battery Installation

1. Ensure the meter is powered off.
2. Locate the battery compartment on the back of the meter (often behind the kickstand).

3. Open the battery compartment cover.
4. Insert two (2) AA 1.5V batteries, observing the correct polarity (+/-) as indicated inside the compartment.
5. Close the battery compartment cover securely.

4.2 External Power Connection

The meter can also be powered via a 5V micro USB cable (not included).



Figure 4: The Excelvan M6013 Capacitance Meter with a micro USB cable connected to its side port, providing external power. The display shows 'SMALL CAPACITOR:' and a reading of 1.02 pF.

1. Connect a standard micro USB cable to the micro USB port on the side of the meter.
2. Connect the other end of the USB cable to a 5V USB power source (e.g., a USB wall adapter, computer USB port).

4.3 Connecting Test Leads

Insert the banana plugs of the test leads into the corresponding input jacks on the front of the meter. Typically, the black lead connects to the negative (-) jack and the red lead connects to the positive (+) jack.

5. Operating Instructions

5.1 Power On/Off

Press the red circular power button once to turn the meter on. Press and hold the power button for a few seconds to turn the meter off.

5.2 Zeroing the Meter

Before measuring small capacitance values (especially pF range), it is crucial to zero the meter to account for the capacitance of the test leads and any stray capacitance. This ensures accurate readings.

1. Ensure the test leads are connected to the meter but are not touching each other or any other object.
2. Press the 'ZERO' button. The display should show a value close to zero, or '0.00 pF'.
3. The meter is now ready for measurement.

5.3 Measuring Capacitance

Important: Always ensure the capacitor to be tested is fully discharged before connecting it to the meter.



Figure 5: The Excelvan M6013 Capacitance Meter actively measuring a capacitor. The test leads are connected to the capacitor, and the meter's display shows the measured capacitance value.

1. Power on the meter and perform the zeroing procedure (Section 5.2).
2. Connect the test leads to the terminals of the discharged capacitor. The meter will automatically select the appropriate range.
3. Read the capacitance value displayed on the LCD screen. The unit (pF, nF, uF, mF) will be indicated.

5.4 Range Selection

The Excelvan M6013 is an auto-ranging capacitance meter, meaning it automatically selects the most appropriate measurement range. If manual range selection is desired or available for specific situations, press the 'MODE/RANGE' button to

cycle through available ranges.

6. Maintenance

6.1 Cleaning

Wipe the meter's casing with a soft, dry cloth. Do not use abrasive cleaners, solvents, or harsh chemicals, as these may damage the plastic housing or display.

6.2 Storage

When not in use, store the meter in a cool, dry place, away from direct sunlight and extreme temperatures. If the meter will not be used for an extended period, remove the batteries to prevent leakage and potential damage to the device.

7. Troubleshooting

- **No Display/Meter Not Turning On:**
  - Check battery installation and ensure batteries are fresh.
  - If using external USB power, ensure the USB cable and power source are functional.
- **Inaccurate or Unstable Readings:**
  - Ensure the capacitor being tested is fully discharged.
  - Perform the zeroing procedure before measurement, especially for small capacitance values.
  - Accuracy can be affected by test lead length and surrounding electromagnetic interference (EMI) or radio frequency (RF) noise, particularly for pF readings. Use the shortest possible test leads.
  - Ensure good contact between test leads and the capacitor terminals.
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